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LIFE-SAVING METHODS IN STILLBIRTHS.

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A few weeks ago I was called in consultation to the bedside of a young primipara in advanced labor. I found upon examination that the child's head was low in the pelvis, and that the cervix was very nearly dilated. The pains seemed good, but for the past two hours there had been no progress of the presenting part. The extraction of the head by means of forceps was a simple task, but after its birth it was found that the advance of the shoulders was arrested by the cord, which was short and drawn tightly around the neck. The cord was, therefore, divided with scissors, and the child was rapidly extracted. It had reached the pallid stage of asphyxia. All respiratory action was suspended, and the heart-pulsations had apparently ceased.

The child was placed upon the table and wrapped in warm cloths. The mucus was expelled from the posterior fauces and from the nasal passages by mouth insufflation. A No. 8 English gum catheter was then passed into the trachea, and the aspirated mucus was removed by suction. The quantity of mucus in the bronchial tubes was large, and the catheter had to be introduced many times. After preliminary clearing of the trachea and bronchial tubes, direct insufflation was practised. In ten minutes slight heart movements were observed, but these ceased when insufflation was suspended. A little later the child gasped from time to time, usually it seemed in response to the irritation of the catheter when introduced into the trachea. An hour's perseverance in this plan of treatment was rewarded by the appearance of a little color upon the surface of the child. The latter was then immersed in warm water, and when lifted from the bath a stream of spirits was poured from a height upon the epigastrium. No respiratory movements were excited. Schultze swinging-movements were next resorted to, and were followed by Sylvester's method; but in employing the latter it was found necessary to

draw the tongue forward and to depress the base to secure a passage for the entrance of air into the lungs. It was, however, nearly three hours, spent in the use of warm baths, cold sprinklings to the surface, and in the alternating resort to Schultze's and Sylvester's methods, before spontaneous respiratory movements were finally established. The next day the child had repeated attacks of tetanus, but these finally grew infrequent, and after twenty-four hours ceased altogether. The child is now robust and healthy, and the joy of a worshipping household.

I grant this story is a familiar one, and yet the incident has stimulated me to treat of the subject of life-saving methods in stillbirths. I do this the more earnestly because I believe the attitude of the profession in general is one of incredulity as regards the efficacy of the means at our disposal to restore the life of children in the more desperate cases of asphyxia. In my experience it is the usual procedure to spank the child, to immerse it in hot and cold water, and then to wrap it in warm cloths and place it by the fire to die. Yet the object of medical practice is to save life, and for my part I regard the rescuing of a newborn infant from impending death to be as distinctly a professional triumph as the saving of life by ovariotomy, by Cæsarean section, or by the operation for appendicitis.

To do effective work it is necessary for the physician to make himself familiar with the physiological conditions which occasion the first respiratory act, and the secondary pathological changes which result from suspended animation. For the mechanical resources employed to restore the circulation, and to excite spontaneous respiratory movements, should not be selected by divining-rod methods, but should be natural sequences of our knowledge of the disturbed conditions calling for relief.

It is, of course, well known that during the period of gestation the child remains in a state of apnœa, and that the respiratory function necessary to its development is performed by the placenta. So soon, however, as the child is born, in normal cases, the thorax expands, the diaphragm contracts, and pulmonary respiration is established. The premature establishment of pulmonary respiration while the child is still in the utero-genital passage, owing to the absence of an atmospheric medium, is followed by asphyxia, and is the usual cause of stillbirths.

The reason of the first respiratory movement in the child, whether prior or subsequent to its birth, has long been a subject for speculation. Omitting earlier views, at present two theories contend for supremacy. The one formulated by Schwartz maintains that in all cases the respiratory act is due to disturbed placental circulation, and the consequent lack of oxygen in the blood of the child. Preyer, on the other hand, insists that respiration is a reflex movement provoked by cutaneous stimuli. He admits, however, that a venous condition of the blood favors the

action of external stimuli by increasing the irritability of the respiratory centres.

As a contribution to the solution of the questions in dispute, Otto Engstrom[1] has recently reported a series of experiments made by him upon gravid rabbits and guinea-pigs, in Preyer's laboratory. The animals were strapped to a board, and were then immersed in a saline solution (six per cent.), which was kept at blood-heat by a special apparatus. The head of the animal was placed above the fluid. A small incision was then made in the abdominal wall, through which a uterine cornu was allowed to escape into the saline fluid. The uterine walls were next opened opposite the mesenteric attachment at the point of least vascularity. As there was no hemorrhage to stain the saline fluid, it was possible to observe the fœtuses through the membranes in the clear amniotic fluid. When this experiment was performed with address and dexterity, the exposed fœtus remained in a state of apnœa, and the blood in the umbilical vein possessed a bright-red color, in marked contrast with the dark hue of the blood in the umbilical arteries.

If now the cord was compressed through the membranes by the thumb and index-finger of the warmed hand, or by self-closing compressing forceps applied to the cord near to the placenta, and as far from the fœtus as possible, respiration followed in from three to six seconds, and continued until death supervened from asphyxia. The same results followed when the umbilical vein was pricked with a needle, or was divided by scissors. Again, in other cases, to avoid the criticism that external stimuli were not absolutely excluded by the manipulations employed, the mother was asphyxiated by carbonic acid gas, or poisoned by woorari, or bled to death by opening the carotid. Here, too, soon after the blood in the umbilical vein became of a venous hue, respirations occurred as heretofore, though all manipulations were carefully avoided. It is, therefore, demonstrated that fœtal respirations are excited, in the absence of external sources of irritation, so soon as the blood in the umbilical veins becomes darkened, or is cut off from the fœtus.

On the other hand, in another series of cases, where the amniotic sac was exposed under a blood-warm saline fluid, and the apnœa was not disturbed, Engstrom gently pricked the extremities of the fœtus with a needle. Reflex movements were excited, but the apnœa continued. When, however, deep puncture was made, the alæ nasi dilated, the mouth opened, and thoracic inspiration was evoked. The effect was, however, momentary, and the apnœa returned.

Again, in order to reduce the disturbance of the placental circulation to a minimum, Engstrom, following a method invented by Preyer, seized the head of a fœtus with the thumb and index-finger through the

[1] Ueber die Ursache der ersten Athem bewegungen.

abdominal walls, and then cut through the abdominal coverings, the uterine walls, and amniotic sac to the nose of the animal. The nose was then lifted above the saline fluid and exposed to the atmosphere. By means of powerful currents of induced galvanism applied to the nasal organ, respiratory movements were excited, but ceased when the current was removed. It seemed doubtful, however, whether inspiratory acts did occur in either series of experiments, so long as the placental circulation was completely undisturbed. The existence of apnœa in the fœtus is not conclusive evidence that the opening of the uterus, or the compression of the uterine walls produces no derangement in the blood-currents of the placenta. The results were often negative at the beginning of the experiment, but as the blood in the umbilical vein darkened, the electric and mechanical irritants produced more and more marked effects.

From these experiments it becomes evident that when the placental respiration is suspended the accumulation of unknown materials in the blood is capable of exciting the respiratory centre in the medulla oblongata of the fœtus without the aid of peripheral stimuli; but that the latter are capable of exciting the respiratory act before the internal stimuli have increased sufficiently to induce independent action. Again, it is a familiar fact that in moderate degrees of asphyxia in the newborn, after the irritability of the medulla has been lowered to a point at which no response follows from the venous condition of the blood, external stimuli are still capable of exciting respiratory movements.

Engstrom found, too, that when the fœtus had breathed in the amniotic sac, after respirations had ceased, and after the blood in the umbilical vein and arteries had become of the same blue color, and the nose and lips had become cyanotic, it was still possible to excite respirations in some cases by opening the amnion and lifting the head so as to expose it to the air, and in others by pinching the nostrils, the ears, and the mouth.

I shall hardly need to apologize for endeavoring to recall to the memory of my readers the peculiarities of the fœtal circulation. The arterialized blood in the umbilical vein empties partly into the portal vein and is first distributed to the liver, and in part passes by the ductus venosus into the inferior vena cava. The mingled venous and arterial currents then enter the right auricle, and are in early pregnancy directed by the Eustachian valve across the right auricle to the left auricle, and thence pass to the left ventricle. As the heart contracts the blood is driven from the left ventricle to the aorta, and is thence distributed by the large vessels which spring from the latter to the head and upper extremities. The blood returned from the upper portion of the body by the superior vena cava, enters the right auricle, where it passes in front of the Eustachian valve to the right ventricle. With the advance of gestation, however, a gradual disappearance of the Eustachian valve

takes place, so that a part of the blood from the inferior cava enters with that of the superior cava into the right ventricle. The contraction of the right ventricle forces the blood into the pulmonary artery, which distributes an insignificant quantity to the lungs, while the main current passes through the ductus arteriosus to the aorta, by which it is distributed to the lower portion of the body. Now, though the greater part of the regenerated placental blood is distributed to the head and upper part of the body, it is mingled largely with venous blood returning from other organs, and that which goes to the respiratory centre in the medulla oblongata is of a character which would cause dyspnœic manifestations in self-breathing individuals.

During labor, especially in the last stage, the placental aëration of the blood is interfered with by the uterine contractions, and in its passage through the pelvis the surface of the child is subjected to pressure and friction. At birth the body is exposed to the air. These combined causes as a rule are followed by pulmonary respiration, though in some instances of lowered irritability of the medulla, prolonged apnœa follows the birth unless the child is made to cry by vigorous slapping.

As the chest expands in the act of inspiration the lungs fill with air, and the blood from the pulmonary artery pours into the opened pulmonary vessels. The pressure in all the vessels of the body is diminished, though in the thorax a partial compensation takes place from the aspiration of blood from the veins which enter the intra-thoracic space. The diminution of pressure is greatest in the pulmonary artery. The current which empties into the aorta becomes of feeble force, and finally ceases altogether. The ductus arteriosus gradually closes, and the pulmonary circuit becomes complete. The withdrawal of the blood from the pulmonary artery, and the force of aspiration, lower the tension in the aorta. The heart beats more slowly. The resulting diminished arterial pressure is most felt in the extremities. The pulsation of the umbilical arteries as a consequence ceases, and the placental circulation is suspended.

In the asphyxia of newborn infants the suspended animation is, with few exceptions, preceded by intra-uterine respirations. The causes of the latter are to be found in tetanic contractions of the uterus and the consequent diminished blood-supply to the placenta, in premature detachment of the placenta, in compression of the cord, and in the sudden death of the mother. Of these the compression of the cord is by far the most common.

The first effect of the compression of the cord is to arrest the circulation in the umbilical arteries. The pressure in the aorta is thereby augmented, and increased work is thrown upon the left ventricle of the heart. Except in cases where the mouth and nasal passages are closed by pressure, with the expansion of the chest, due to the irritation of the

medulla by the increased venosity of the blood, amniotic fluid, meconium, and mucus are aspirated into the air-passages. When the compression of the cord is temporary the circulation may be restored, and the apnœa may again return; but in cases where the respirations continue, the capillaries of the lungs fill with blood from the pulmonary artery, the intrathoracic venous congestion is increased, and the heart action is lowered. As the irritability of the medulla sinks, the respirations fail, the cavities of the heart fill with venous blood, the lungs are congested, and in some instances sub-pulmonary ecchymoses result from over-distention of the pulmonary vessels. Outside the thoracic cavity, the venous trunks are often distended with blood. This secondary venous stasis is most marked in the vessels of the neck, head, and brain, but to a less degree venous stases are likewise observed in the abdominal organs and in the capillaries of the skin.

After the birth of the child the prognosis is dependent upon the degree of asphyxia. In the milder cases the muscular tonus is preserved, the head does not drop, the extremities are not relaxed, the skin is dusky-red or cyanotic, the conjunctivæ are injected, the umbilical vessels are distended, and the cardiac and umbilical pulsations are slow but forcible. Reflex movements are easily produced by surface irritation. In these cases spontaneous respiratory movements often occur.

In the more advanced stage, the muscular tonus is lost, the head falls to one side, the sphincters are relaxed, the eyes are glazed, reflex movements cannot be provoked, the heart-beats are feeble and infrequent, the umbilical vessels are nearly empty, and the pulse scarcely perceptible. The cutaneous circulation has disappeared, and the surface is pale and cold.

If respirations occur, they are feeble and are not associated with movements of the muscles of the face. The first signs of returning animation are the refilling of the cutaneous capillaries and the restoration of the muscular tonicity. In fatal cases the pulmonary vessels are found to be widely distended, the lungs are heavy and of a dark-red color, and pulmonary, subpleural, subpericardial, and subendocardial ecchymoses are present. The obstruction of the pulmonary circulation further produces congestion of the abdominal viscera and of the brain.

The indications for treatment are in all cases to clear out the air-passages, to restore the irritability of the medulla, to increase the force of the heart contractions, and to relieve the plethora of the heart and of the blood-channels of the thorax.

In cases where the muscular tonus is preserved these indications are, as a rule, easily fulfilled; aspirated fluids and mucus should be cleared from the fauces with the finger. If the nasal passages are obstructed, mouth-to-mouth insufflation should be employed. The child should be made to cry by flagellation, and the respiratory movements should be

further stimulated by alternately immersing the child in hot and cold water. So far the procedure is a familiar one, but in a good number of cases we know that in a few days the skin becomes dusky, the heart action feeble, and the child has been temporarily restored to life only in the end to die of atelectasis. As a means of guarding against this fatal sequence, due in part to imperfect expansion of the lungs, in part to lobular congestion, there is no method that rivals the one of Schultze.

Schultze directs that the child should be grasped in such a manner that the operator's thumbs rest, on either side, upon the anterior thoracic wall, while the index-finger occupies the axilla, and the remaining fingers are placed diagonally across the back. The child is then allowed to hang at arm's length between the knees of the obstetrician, its face being turned to the front. In this position the pectoral muscles are made to draw the superior ribs upward, the abdominal muscles draw the inferior ribs downward, and the weight of the liver causes the descent of the diaphragm. By this means the capacity of the chest is increased and inspiration is produced. The child is next swung upward, until the arms of the operator reach an almost horizontal position. The swinging motion is then arrested, flexion occurs in the child's lumbar spinal region, its head is directed downward, and its lower extremities fall slowly toward the obstetrician until the whole weight of its body rests upon his thumbs. In this way the chest and abdomen are powerfully compressed, the diaphragm is forced upward, and an efficient expiration results, and any retained adventitious matters are expelled from the air-passages. An inspiration is now produced by reversing the direction of the swing and returning the child to its former position of complete extension, by which manœuvre the chest is made to expand and the diaphragm to descend.

By this method not only is good aëration of the lungs secured, but the forcible expiration expels the materials aspirated from the bronchial tubes. A still more important action, according to Schultze, is the relief of the overloaded vessels as a result of the compression of the entire thoracic contents. Thus, as expiration is produced by the upward swing the blood is pressed from the left ventricle into the aorta, and from the right auricle into the right ventricle. The emptying of the left ventricle makes room for the contents of the left auricle and permits the return current from the pulmonary veins. From the right ventricle the surplus blood finds a passage into the aorta through the ductus arteriosus. With the inspiratory swing blood is aspirated from the peripheral vessels into the blood-channels of the thorax. The aspirated blood is, however, venous, as the semilunar valves prevent regurgitation from the aorta. By alternating the expiratory and inspiratory swinging movements the pump-working of the heart is mechanically set in action. As the blood-

streams pass through the heart cavities the systole increases in force and the arterial tension is restored.

In cases of deep asphyxia, in which muscular tonicity is lost, and the heart movements are scarcely perceptible, the methods at first employed should involve the minimum degree of disturbance to the child. Active movements are, as a rule, speedily followed by the extinction of heart pulsations.

The child should be laid upon a table and covered warmly. After clearing the fauces and nasal passages a No. 8 English elastic catheter should be passed under the guidance of the fingers of the left hand through the larynx into the trachea, and aspirated matters should be carefully removed by suction. This often requires time and the repeated introduction of the tube. Meantime, at intervals, insufflations through the tube into the bronchial tubes should be employed. After each insufflation the chest walls should be compressed with the hand to produce expiration. By this means, little by little, the blood receives oxygen, and the returning irritability of the medulla is manifested by occasional spontaneous respiratory movements. Then the Sylvester's method, which Champneys has shown is followed by the fullest expansion of the air-cells, is of service. Only, to secure favorable results it is often necessary to draw the tongue well forward. So soon as the heart movements become plainly perceptible the child should be placed in warm water, and sprinklings of cold water upon the face should be practised. Finally, the swinging method of Schultze should be employed to complete the establishment of the normal circulation.

But in these cases of deep asphyxia no miracles are to be wrought without patience, watchfulness, and a hopeful spirit. Often, when a certain amount of progress has been obtained, the heart action begins to die out, and we find ourselves obliged to go back to the catheter and insufflations anew. There is, however, no greater joy to the physician than that which comes from watching the gradual restoration to life of a young child, and to know that the life has been saved by the intelligence and the knowledge which God has given to us.

OBSTRUCTIVE DISEASE OF THE LOWER EXTREMITY OF THE ILEUM.

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I have entitled my paper "On Obstructive Disease of the Lower Extremity of the Ileum," for, although in their morbid anatomy, the cases I propose to narrate differed importantly among themselves, the

fundamental clinical fact in each was the existence of obstruction in the situation indicated, and the symptoms which the patients presented were identical, and collectively distinctive of the mechanical character and site of this lesion. Each case, no doubt, presents some special point or points of interest which give it individuality, and to which I shall call attention; but I am afraid I must acknowledge that their general effect is not so much to teach anything actually new, as to afford a striking and impressive confirmation of facts with which most of us may be supposed to be fairly familiar. Clinically they may be considered to correspond to the cases to which Dr. Hilton Fagge, many years ago, applied the term "contraction of the small intestine."

It will be most convenient to give a brief narrative of each of my cases, making a few comments in the course or at the close of each; and to conclude with some remarks suggested by the cases collectively.

CASE I. *Obstructive disease of the lower part of the ileum, due to adhesions.*—Keziah P., aged seventeen years, was admitted some years ago into St. Thomas's Hospital under the care of my obstetrical colleague.

She was said to have had typhoid fever at twelve years of age; at any rate she seemed to have had at that time some serious disease, attended with abdominal symptoms which had laid her up for three months. While suffering thus, a tumor had been discovered in the lower part of the abdomen on the right side, just above Poupart's ligament. Since her convalescence from this illness she had on the whole enjoyed fairly good health, but the tumor had never disappeared, and she had been liable to attacks of colic. The tumor had not varied in size, but had sometimes been tender to pressure, and occasionally after much exertion, or maybe without any obvious cause, she had experienced aching pain in or about its situation. The colicky attacks had come on quite irregularly, sometimes pretty frequently, at other times intermitting for several weeks, usually attended with vomiting, and often lasting off and on for two or three days at a time. The bowels were said to have been regular.

During the last few months her symptoms had become more severe, the tumor had not increased in size or become more tender than it had been, but the attacks of colic had grown in frequency, the abdomen had enlarged, she had suffered much from sickness, and she had become emaciated and weak.

She was admitted into my colleague's ward in the belief, I presume, that her symptoms were due to some affection of the reproductive organs. But, in consultation with myself, this view was discarded, and on the twelfth of December she was transferred to one of my beds.

She was a bright, attractive-looking girl, but very thin and weak. She complained of severe colicky pains, coming on frequently night and day, and lasting from a few seconds to a minute or two at a time; of distention of the abdomen; of frequent sickness; and of loss of appetite. There were no indications of intra-thoracic disease, beyond some displacement of the heart and lungs upward, and some undue dulness of the lower part of the chest behind. The abdomen was much distended, and, on observing it during her paroxysms of pain, dilated coils

of bowel could be seen to rise into prominence all over its surface, to present undulatory movements, and then, with a gurgling sound, gradually to resume their quiescent state. The pain was evidently very severe while it lasted. There was an obvious tumor, roughly speaking, about the size of a hen's egg, in the centre of the right ileum, and immediately over the middle part of Poupart's ligament. It was neither hard nor dull on percussion, but was just such a tumor as might have resulted from some old inflammatory thickening about the cæcum. There was no abdominal tenderness, and in the intervals between the paroxysms, the belly, though considerably enlarged, and presenting superficial indications of dilated bowels, was soft and flaccid. There was no enlargement of liver or spleen. She was sick once or twice a day, the vomit consisting for the most part of the ordinary contents of the stomach. Her bowels were regular, sometimes indeed opened two or three times a day; the motions being somewhat fluid, of a bright yellow-ochre, and very offensive. The temperature was normal.

She remained under my care for about a fortnight, during which period her condition gradually but decidedly deteriorated; the attacks of colic and violent peristalsis (although the pain attending them was relieved to some extent by opiates) continued without abatement; she was frequently sick, and could take little or no food; her evacuations, for the first few days, were fairly regular and of the character above described: but during the last eight days the bowels were obstinately confined. The abdomen, as at first, though distended, was soft and flaccid and free from pain or tenderness in the intervals between the attacks of colic. The tumor continued without change. Her temperature was for the most part normal or subnormal.

Toward the end of the fortnight it had become obvious that unless something could be done to relieve the obstruction which obviously existed somewhere in the neighborhood of the ileo-cæcal valve, or of the lower part of the small intestine, she would speedily sink, not from the effects of actual impermeability of the bowel, but from the pain, sickness, and innutrition which were the chief symptoms of her malady. And on the afternoon of December 26th, I decided to have, as a preliminary palliative measure, the distended bowel punctured in one or two places, in order to allow of the escape of some of the accumulated gaseous contents. I did not care to do the operation myself, as at that time I was not very familiar with it; and at the moment I was unable to obtain the assistance of any one of my surgical colleagues. Just, however, as I was leaving the Hospital to keep an important appointment, I met one of the junior surgical staff, explained the case, as I understood it to him, and asked him to see it with my house-physician, and, if he agreed with me, to perform acupuncture in two or three places.

When I reached the Hospital the next day at two o'clock, I learned that my patient had died in the course of the night and that a post-mortem examination was about to be made on her. I also learned something more, namely, that the surgeon on puncturing the bowel came to the conclusion that he had punctured an abscess-cavity, and, despite the entreaties of the house-physician, had insisted on tying the trocar in, and kept it there for half an hour or more. Acute peritonitis set in even before the trocar was removed and she died of collapse in the course of a few hours.

At the *post-mortem* examination there was discovered general acute peritonitis, without, however, any material effusion of fluid or of lymph. The lump detected during life in the right iliac fossa was found to be due, not to diseased cæcum or ovary, but to a kind of tangle of the lower part of the ileum caused by some old bands of lymph. This tangle began eight-and-twenty inches from the ileo-cæcal valve, and involved about fifteen inches of the bowel above. At the upper limit there was a sudden contraction of the bowel, and this was maintained not only throughout the tangle, but down to the cæcum. The intestines above were largely distended throughout, in some places measuring as much as three and a half inches in diameter. The cæcum and large intestine were of small diameter, and the sigmoid flexure, extending across the abdomen, was adherent to some extent to the mass occupying the right iliac fossa. At about eight feet from the cæcum was a perforation in the smaller bowel, nearly large enough to admit the tip of the little finger; this was surrounded for three-quarters of an inch by lymph discolored with fæcal matter, which had attached its margins to the anterior abdominal wall. Further examination showed that the parietes of the dilated bowel were much thickened, especially immediately above the contracted portion; that the latter was healthy in structure and pervious throughout; that the large intestine was healthy, and that, while the distended portion of the smaller bowel contained a large quantity of thin fæcal matter, there were traces of similar fæcal matter in the contracted bowel and small quantities in the colon. There was nothing to show that the old peritoneal adhesions had any relation to former typhoid or any other ulceration of the bowel.

The bases of the lungs were collapsed and void of air; but the lungs in other respects, and all the other viscera, were healthy.

I assumed, during life, that the patient was suffering from some old disease of the cæcum, to which the tumor in the right iliac region was due; that such disease was the cause of the partial obstruction which had led to the dilatation and hypertrophy of the small intestine, and to its exaggerated and painful action; and that the so-called attack of typhoid fever five years previously had really been an attack of typhlitis. The lump, however, was not cæcum, but an entangled knot of bowel. It is clear she must have had localized peritonitis, probably at the time of the attack above referred to; but what the cause of this peritonitis was must remain in doubt. It seems not improbable, however, that the alleged attack of typhoid fever was really an attack of this disease, and that the peritonitis was a consequence of it. The lamentable misadventure which terminated the poor girl's life furnishes no valid argument against puncture of the bowel judiciously performed in such cases; but it proves that the operation is one likely to be attended with serious results in the absence of reasonable precautions.

Case II. *Obstructive disease of the lower part of the ileum due to adhesions.*—A very similar case to the above was published by me about three-and-twenty years ago in the eighth volume of the *Pathological Transactions.*

The case was that of a man aged forty years, who had been attacked suddenly with severe colic ten weeks before his death. In the early part of his illness such attacks occurred in bouts of two or three days' duration each, coming on at comparatively long intervals. But during the last month (for three weeks of which time he was under my care) he was suffering from almost constant abdominal pain and tenderness, associated with paroxysms of colic recurring every five or ten minutes; in which the abdomen became distended, and the inflated coils of intestine remarkably distinct. During the paroxysms the progress of the peristaltic movements could be followed with the greatest facility and there was much gurgling. He was thirsty, had no appetite, and frequently vomited stercoraceous fluid. While under observation he passed but little fæcal matter, and this mainly under the influence of enemata; but there was never any proof of complete obstruction. His death was from gradual failure of his vital powers.

At the *post-mortem* examination the small intestine was found for the most part enormously distended, its color heightened, and bands of rather intense capillary congestion extending irregularly along the coils; but there was no effusion of lymph or of fluid. On tracing the small intestine from the duodenum downward, it was found in the condition above described, as far as the middle of the ileum; from which point to within a foot of the cæcum, the coils were adherent to one another and to the brim of the pelvis by congested and readily-lacerable bands and filaments of false membrane. The portions which were adherent were so entangled that it was difficult to unravel and trace them. The greater part of the involved intestine was dilated. The lower part, however, and all that intervened between it and the cæcum, were contracted to the diameter of the tip of the little finger. The cæcum and large intestine were contracted throughout. The mucous membrane was everywhere healthy. The dilated small intestine was loaded with thin, pea-soup-like fluid; but the contracted part (which, however, was quite pervious) was empty. There were a few small, solid fæcal lumps in the ascending colon.

I came to the conclusion at the time that the peritoneal adhesions were the result of an attack of peritonitis occurring at the beginning of the patient's illness; and that the obstruction was due to the embarrassment to the action of the bowels resulting from the contraction of the adhesions external to them.

Case III. *Obstructive disease of the lower part of the ileum due to cicatricial tissue.*—A. W. H., aged sixty-three years, admitted under my care on February 27, 1888. He first failed in health about twelve months previously, but it was not until last July that he began to suffer from attacks of constipation, attended with much griping pain and vomiting. The attacks of constipation, which came on irregularly, would occasionally, he said, continue for three weeks; and during their continuance he would suffer from a constant gnawing pain in the epigastrium and frequent recurrences of severe griping and vomiting. He has had eight or nine such attacks; of which the last (from which he is still suffering) came on about three weeks ago. He has been rapidly losing strength and flesh lately. He never passed blood by the bowels.

State on admission: Much emaciated and complaining of the symptoms above detailed.

He remained in the hospital until March 12th, exactly a fortnight. During the earlier part of this time attacks of colic, attended with violent peristalsis, came on about every twenty minutes, and lasted each two or three minutes, or more. While thus suffering, the superficial coils of intestine could be seen swelling and moving as though they were a bundle of snakes, the abdomen became distended, and loud borborygmi were heard. When the attack subsided, the abdomen still remained rather full, but was comparatively flaccid and easy to explore. There was no particular tenderness; and no tumor or enlargement of any organ could be detected. He often complained of nausea, but was only sick once. The vomit did not present either sarcinæ or yeast fungus. The bowels were inclined to be constipated; but the motions were generally abundant, semifluid, and of a greenish hue. His urine once or twice presented a trace of albumin; his pulse varied from 60 to 70, and his temperature from 96.2° to 98.4°.

During the last week there was progressive amendment; the colicky attacks diminished in frequency and severity, although never absolutely disappearing; he lost his nausea; and his bowels became fairly regular. The abdomen, however, remained unduly tumid. His temperature continued for the most part subnormal. He did not gain strength.

Feeling better, he left at his own request.

On the 21st (that is, nine days later) he was readmitted. His bowels had not been open for five or six days; and during this period he had been suffering from frequent attacks of colic, and had had much sickness. For three or four days after admission, the bowels still remained obstinately confined, notwithstanding the employment of castor oil and other mild purgatives, and enemata. The condition of things was precisely that previously described. The attacks of colic came on every ten or fifteen minutes or so, and lasted for two or three minutes; the pain was evidently very severe; and during its continuance beads of perspiration would gather on his forehead; coils of intestine swelled up, hardened, and stood out in prominent relief; and there was much gurgling, especially toward the close of the attack. The vomiting was not specially connected with the taking of food, and was mainly of watery mucus more or less stained with bile.

He remained in the hospital for about two months, during which time he steadily got thinner and weaker, but his abdominal symptoms underwent considerable fluctuations. For the most part he suffered from looseness of bowels, the evacuations (excepting that they were semifluid) being normal in quality. Occasionally, for three or four days at a time, he was constipated. The attacks of colic varied in frequency and severity. They never absolutely left him; for periods of two or three days he would suffer comparatively little, and express himself as "doing finely"; but for the most part they were frequent and severe, and attended with all the usual accompaniments. During the time he was under observation there was no obvious relation between them and the presence of either constipation or diarrhœa. His sickness also presented variations. Not infrequently he was free from it for several days; these periods for the most part corresponding to the periods in which colic was in abeyance. Sometimes it occurred frequently; and often he complained of nausea. When fairly free from pain and sickness he had

a desire for food and could take it; and this was so almost to the last. The tongue was sometimes coated in the centre, but for the most part was fairly healthy-looking. The abdomen continued unduly large and tense, and was at times (especially when he was suffering from pain) somewhat tender; but there was never any indication of fluid or of tumor. The urine was usually scanty, but of normal specific gravity, and free from sugar and albumin. His pulse, which was weak, ranged from 80 to 88. His temperature was always subnormal, varying from 95° to 97.6°.

On May 25th it was remarked that, although his abdominal symptoms were not, and had not been for a few days, troublesome, he was getting very weak, and that he complained of sore throat and was husky. On the 27th I made a note to the following effect: "The patient does not suffer so much from pain as he did, he has not been sick for some days, and he takes food fairly well; but he gets thinner and weaker, his pulse is barely perceptible, and his hands, feet, and face are cold, livid, and mottled."

After this he passed into a condition of semi-stupor, in which he failed to recognize those about him, refused all food save a little wine, his pulse became imperceptible at the wrist, and his extremities very cold, his internal temperature remaining subnormal. He died a little before noon on the 29th.

Autopsy: An extremely emaciated man with slight œdema of both feet. On opening the abdominal cavity the intestines were found to be moderately distended. On further examination the large intestine throughout its whole length was found collapsed, and the small dilated down to within two inches of the ileo-cæcal valve. At this point the bowel was evidently narrowed, and cicatricial tissue was seen in its wall. On opening the intestines the larger was found to be healthy in its whole extent as also were the cæcum and its valve. But at the point in the smaller bowel above referred to, the channel was obstructed by an oval, softish mass, about as large as an almond-shell, projecting inward from one side. This projection, though having the form of a growth, occupied the convexity of a kind of kink in the course of the bowel; and, on section, appeared to consist solely of greatly hypertrophied mucous membrane, thickened muscular coat, and a comparatively large core of indurated subperitoneal tissue. No true new-growth was recognized, but it may be added that, where the kink existed, and whence the tumor appeared to spring, the two opposed surfaces of the peritoneal coat were firmly united together by old adhesions. The mucous surface of the small intestine both in the situation of the tumor and elsewhere was perfectly healthy. In the mesentery, occupying the ileo-cæcal angle, and just outside the strictured spot of bowel, a hard oval mass nearly as large as a pigeon's egg was felt. On section this presented a most unusual appearance. The middle part, comprising about a third of the whole sectional area, was a soft reddish mass; the periphery about half an inch thick, consisted of dense fibrous tissue concentrically arranged. It did not present the character of a new-growth, but it seemed probable that it was a disorganized gland which had become surrounded with a capsule of inflammatory origin.

Here and there in the peritoneum old adhesions were found, more especially between the liver and diaphragm, and the whole of the portion of mesentery in the ileo-cæcal angle was thickened and puckered.

All the other abdominal organs were healthy; as also were the nerve-centres. Both lungs were intensely congested in their dependent parts, and dotted with islands of recent broncho-pneumonia. The aortic and mitral valves were thickened, but there was no serious cardiac disease.

The resemblance of this case to that of Keziah P. was in its symptoms so striking that while the patient was still alive I could scarcely avoid regarding it as of the same nature, and I leaned to the belief that (even though no definite lump could be felt) there was an obstruction at the lower end of the ileum, and that that obstruction was due to the entanglement of the bowel by old adhesions. There was old inflammatory mischief, and also there were adhesions; but the obstruction, as has been shown, was due, not to the latter, but to a narrowing of the lower end of the ileum effected partly by the presence of a kind of cicatrix occupying one side of the gut, and partly by a projecting lump caused apparently by thickening of the intestinal walls at that part. Again, the cause of this condition remains doubtful; and there was nothing in the patient's history, as it was elicited from him, to afford a hint toward the solution of the problem. I must confess I am inclined to suspect, in this case as in the other, that the phenomena present were really the sequelæ of a former (and forgotten) attack of typhoid fever. The curious lump discovered in the mesentery in the neighborhood of the obstruction seems to be best explained on the assumption that it was a disorganized gland which had become encapsuled. If such were the case, it enhances the probability of the typhoid fever hypothesis being the true one.

The clinical phenomena of the latter part of the patient's illness point, I conceive, to death, not from obstruction directly, but from innutrition and asthenia.

Case IV. *Obstruction of lower end of ileum due to malignant disease of the ileo-cæcal valve.*—William R., a plumber's mate, eighteen years of age, was received into one of my wards on the 23d of June, 1890. He had had good health down to the commencement of his present illness, and had been a plumber's mate for three years.

Early in May he had an attack of colicky pain which, starting from the right groin, radiated over the abdomen. After lasting two or three minutes it passed away, only to recur thenceforth at irregular intervals. Diarrhœa accompanied the onset of the pain and lasted three or four days; since when the bowels have been quite regular. A week or two after the beginning of his illness he began to observe that the attacks of pain were attended with swelling of the abdomen, and subsided with a gurgling sound. He has had no sickness or loss of appetite, and has not observed any blood or anything else abnormal in his motions. The bowels have latterly been open two or three times a day. He thinks he has lost flesh.

He is anæmic and emaciated, and complains of paroxysmal attacks of abdominal pain coming on at intervals of ten minutes or so. Each

attack is attended with the swelling-up of coils of bowel, generally first observable in the right iliac fossa, but gradually extending over other parts of the abdomen. The convolutions become distinctly mapped out, sink and swell and vary in size and tenseness, until at the end of from twenty to thirty seconds a loud gurgling takes place, apparently in the neighborhood of the umbilicus, the distention subsides and the parts become quiet. During the attack the patient suffers from severe pain, but is almost quite free from tenderness. In the intervals the abdomen, though large and prominent, is flaccid, and admits of ready examination. There is no enlargement of liver or spleen, and no tumor excepting a hard, smooth, painless lump, deeply seated in the right hypochondrium just below the tips of the ninth and tenth ribs. This was described by the house-physician as extending, at the time of admission, for a distance of two inches below the ribs, but I never myself found it extending more than a finger's breadth in this direction, or measuring more than an inch and a half horizontally. No further evidence of disease is detectable, either in the abdomen or in the chest. Tongue clean. There is a red line along the margins of the gums, but no blue discoloration. Urine free from albumin and sugar. Temperature normal.

For twelve days after admission the patient's condition underwent no material change. The abdominal pains and peristaltic movements of the bowels continued to come on every few minutes, although both were kept to some extent in abeyance by opium. The abdomen was generally tense but not markedly tender. The lump which had been recognized on admission remained without obvious change. His appetite was poor and he was occasionally sick. The bowels acted irregularly but sufficiently. The temperature remained subnormal.

On July 5th it was noted for the first time that the abdominal cavity contained fluid. This increased during the next few days and the belly became very tense and somewhat tender. The colicky pains and movements continued, and the latter were still strikingly obvious through the parietes. His tongue got coated; his appetite disappeared; he was still sick from time to time. The bowels became much constipated, and indeed, from about July 5th onward there was no satisfactory action. Yet they were occasionally relieved slightly by enemata or castor oil, and he continued to pass flatus. There was still no rise of temperature. About July 7th a patch of anæsthesia appeared on the front of the right thigh, in the domain of the middle cutaneous nerve, associated with some neuralgic pain, which phenomenon continued.

On the twelfth he was extremely weak and ill. The abdomen was very tense and tender and contained a good deal of fluid. The colicky attacks continued, though they were hardly so severe as they had been. He was scarcely sick, but did not take food. His temperature was still subnormal. He passed flatus but there had been no evacuation for two days. It may be added here that the evacuations had never presented any blood and were for the most part half-formed.

As the bowels were extremely tense it was determined to puncture them to let off some of the flatus. This was done in the afternoon, but only a little gas escaped and no benefit resulted. He died at 10 P. M.

Autopsy: Body much wasted; no *rigor mortis*. The abdomen fairly large but extraordinarily tense. On making an opening into it, turbid yellow fluid spurted to a height of about three feet, clearing the table.

In this way perhaps two or three pints were discharged. On laying the abdomen open, nothing but much distended small intestine was visible, everywhere brightly injected, but showing no evidence of past or present inflammation. On exploring the cavity, a large, hard mass was at once felt in the upper part of the right loin, but was not visible. It lay under cover of the liver and on the anterior surface of the right kidney. On further examination, the mass, which was as large as a man's fist, was found to be due to a growth (originating in the situation of the ileo-cæcal valve, but involving both the ileum and the cæcal walls in the immediate neighborhood), which had passed by intussusception into the ascending colon for a distance of about six inches. The intussusception could not be reduced. The tumor was annular in form, with a narrow channel of about two inches in length, and allowing the passage of the little finger in its axis. Its surface was purple and congested. On section it was hard and white. The portions of the bowel involved in the intussusception were not materially congested. The small intestine, as above stated, was extremely distended, containing some flatus and a large quantity of bright yellow pasty fæces. It was free from ulceration or other disease.

There were numerous enlarged glands in the mesentery and in front of the vertebral column, up to the size of a pigeon's egg. They were very soft and pinkish-white on section. The morbid growths were small, round-celled sarcoma.

Of the three punctures made shortly before death all were visible in the abdominal walls; but only one was discovered in the intestine as a minute scratch without any extravasation.

All other organs were healthy.

The symptoms in this case again were so similar to those of the cases that had gone before, that I was compelled to the conclusion that, in it as in them, there was some obstruction in the smaller bowel near the cæcum; and, knowing how common a cause of obstruction adhesions in this situation are, I concluded that there were adhesions. Adhesions, however, are very frequently connected with the presence of peritoneal cancer or tubercle; and the discovery of a lump, apparently having some relation with the liver or the peritoneum in its vicinity, tended to confirm the suspicion that the boy was suffering from one of these affections. The coming on of ascites later, as I thought, settled the question. I acknowledge I never had any suspicion that he was also the subject of intussusception, or that the small lump I recognized during life was the lower end of a much larger mass tucked up under the liver. But I may add that, while I admit that an ileo-cæcal intussusception might, and often does, produce symptoms identical with those exhibited by my cases, I think, as a matter of fact, the intussusception in this instance had no influence over the patient's symptoms or the progress of his case.

The question as to whether the patient's symptoms were due to lead-poisoning was raised several times. I did not acquiesce in that view; nevertheless, for a short time he was treated with iodide of potassium; but, needless to say, without benefit.

CASE V. *Obstruction of lower part of ileum due to malignant disease.*—John H. C., a clerk, aged twenty years, a patient of Dr. James Barbour, was admitted under the care of Mr. Sydney Jones on the 21st of July of the present year, and on the 31st was transferred to mine.

His health had been good down to the previous November, when he was first attacked with severe pain in the umbilical region coming on after taking food. From that time until February the attacks seem to have occurred daily, supervening on every meal, and lasting for an hour or so. In February the quality of the pain altered. It assumed more of a "tearing" character, commencing in the right iliac fossa and thence radiating over the abdomen, and was attended with flatulent distention. Attacks of this kind have continued ever since, coming on irregularly; sometimes in severe paroxysms, sometimes for a week or two together in a mild and bearable form. About the end of March his medical attendant discovered a lump in the cæcal region, which the patient lost after lying up for five or six weeks. In April he became sick; and for the six weeks prior to admission he has suffered from sickness, mainly in the morning, and occurring about once a week on the average. His bowels have been inclined to constipation all along, but have been kept free by the use of enemata. He has gradually failed in strength, and has lost forty-two pounds in weight during the last eight or nine months.

State on admission: Patient is anæmic and emaciated, complaining of pain after food with habitual constipation, and frequent attacks of flatulent colic, followed occasionally by sickness. The abdomen is somewhat resistant and distended. At intervals varying from five to ten minutes, he experiences a sharp pain in the right iliac fossa, accompanied by sudden distention of the bowel in that situation, and subsequently by distention of various coils of small intestine. So dilated do they become that the abdominal wall, moulded to them, reveals by its inequalities and movements the varying state of the parts beneath with remarkable distinctness. This condition having been maintained for about twenty seconds, there follows a loud gurgling sound, with the cessation of which the abdomen becomes quiescent. There is a little pain on pressure and some sense of resistance, but no definite tumor, in the right iliac fossa. No tumor or enlarged organ can be felt anywhere else; and there is no indication of the presence of fluid effusion. The solid organs of the abdomen and the thoracic viscera all appear to be healthy. The urine has a specific gravity of 1022, is acid, and free from albumin. Tongue clean; appetite poor; bowels confined; pulse 80; temperature normal.

On August 5th he was examined under chloroform, and a lump about the size of a tangerine orange was felt deep-seated in the right iliac fossa.

On the 12th, an exploratory operation was performed by Mr. Pitts. The abdominal cavity was opened in the right linea semilunaris. A little clear fluid escaped through the wound; and numerous adhesions between the bowel and adjoining parts were discovered, some of which had to be broken down. The cæcum was fixed and could not be brought into view; but a hard new-growth was felt, apparently involving the wall of this viscus and of the lower part of the small intestine for several inches. It appeared also to extend downward into the upper part of the pelvis. Several of the mesenteric glands were enlarged; and a mass of similarly-enlarged glands occupied the retro-peritoneal tissue. In addition, many small white bodies, the size of rape-seed, studded the peri-

toneal surface. It was clear that there was disseminated malignant disease of the intestines and peritoneum, and the operation, therefore, was abandoned.

The patient suffered no serious inconvenience from the operation, and the wound soon healed. He is still under treatment, and remains in much the same state as on admission. He has apparently lost flesh somewhat and become weaker; but otherwise there is no marked impairment in his health. A tumor can still be felt, but it has not obviously increased in size. He remains liable to attacks of flatulent colic, which vary in severity, frequency, and duration; are sometimes, even for days together, so slight as to be of little trouble to him, sometimes for hours or days at a time very intense. He still suffers from nausea, and occasionally from sickness; but often has a fair appetite. His bowels vary; are occasionally a little constipated; but, on the whole, partly under the influence of enemata, partly of their own initiative, act regularly and freely, sometimes two or three times a day. The evacuations are mostly semi-fluid, and once or twice of late have been accompanied by a little discharge of red blood, but are otherwise normal in quality. The abdomen remains full and more or less tense, and usually free from tenderness; but handling it, or exposing it to the air, generally brings on attacks of colic. The urine is free from sugar and albumin. His temperature has occasionally risen to 100°, but has remained almost continuously normal or subnormal.

I have no particular remarks to make on this case, excepting that the presence of a tumor which had been observed off and on for some time, and the progress of events, led to the belief that this patient, like the last, was suffering from abdominal malignant disease; and that, although an operation was not looked upon at all hopefully, it was (considering the invariably unfavorable issue of all my other similar cases) thought desirable to afford him even this shadow of a chance of relief.

It will be admitted, I think, that in their main clinical features each of the foregoing cases was so much a counterpart of every other, that it was only natural that, as case after case came under observation, the family likeness they presented among themselves should be noted, and that they should stand out in my mind as a characteristic group. The points in which specially they resembled one another were: the frequent attacks of painful colic associated with visible and violent peristaltic action of the smaller bowel, the absence of anything like complete intestinal obstruction, their chronic progress, and their invariably fatal tendency.

The cases with which (looking at them after the event) one would be disposed to compare them are cases of obstructive disease of the colon, cases of disease of the cæcum, and cases of acute obstruction of the smaller bowel. But the differences between those several affections and my own cases are for the most part obvious. In obstructive disease of the colon, the patient may, of course, have had premonitory symptoms lasting over many months, but death is generally due to the coming on

of insuperable constipation with its usual accompaniments; he may, of course, have attacks of colic and of visible peristaltic movement, but these for the most part follow on complete obstruction, and even then are rarely, if ever, so continuous or so violent as they were in my cases. It is admitted that the larger bowel is, as a rule, less readily excited to violent peristaltic action than the smaller bowel; and in disease of the colon, the lesser bowel usually takes but little active part in this process, owing doubtless to the fact that the ileo-cæcal valve readily allows fluid or semi-fluid matters from above to be transmitted into even a distended colon, while it prevents any regurgitation, and the small intestine consequently is protected to a large extent from the direct influence of the stoppage below.

In diseases of the cæcum, at any rate in typhlitis and in malignant disease involving the wall of this viscus, there are of course local pain and tumor, but there is not generally at any time absolute stoppage; and although, no doubt, in some cases the smaller bowel becomes after a time excited to undue peristaltic action, it must be very seldom if ever that one meets with such persistent and violent peristalsis as my cases exhibited. I have met in the last few years with three cases of fatal cancer of the cæcum; but in none of them was there serious obstruction, and in none were attacks of colic noted.

Diseases of the small intestine attended with complete obstruction are always, so far as I know, acute, and, as a matter of fact, are either intussusception, strangulation, incarceration, volvulus, or the impaction of a large gall-stone. I need scarcely say that in all these cases the symptoms come on suddenly, the cases are of acute progress, and violent peristaltic movements of the bowel are either very slight or conspicuous by their absence.

My cases all fall clinically, as I have already stated, into the category of cases which Dr. Hilton Fagge termed "contraction of the small intestine," and which correspond to the strictures of the large intestine. That is, they are cases of chronic obstructive disease of the smaller bowel; but they are cases in which the patient dies, not from the supervention of complete stoppage which usually brings these latter cases to an almost sudden close, but from the gradual influence of the impediment over the bowel above and the gradual induction of innutrition and asthenia. One main reason for the different termination of these two varieties of obstruction is that in the larger bowel the fæces tend to solidify and become difficult of passage through a narrow orifice, while the contents of the small bowel remain, as a rule, semifluid or pulpy and transmissible to some extent to the last. It is obvious that the combination and progress of symptoms in such cases as I have brought forward are determined less by the nature of the disease present than by its seat. As I have shown, the clinical phenomena in all my cases

were as nearly as possible the same; and yet in two the obstruction was due to adhesions compressing and embarrassing the bowel; in one it seemed to be referable to a kind of stricture produced by some localized inflammatory condition in the intestinal wall, and in two it was caused by malignant disease—in one certainly involving the ileo-cæcal valve and the ileum in its neighborhood, in the other almost certainly affecting identically the same parts. I may add that I have met with more than one case of chronic intussusception in adults implicating the ileo-cæcal valve, in which the symptoms were in great measure the same; and that disseminated tubercles or cancer of the peritoneum, associated with adhesive inflammation, may, of course, have the same effect on the bowels as adhesions resulting from simple inflammation. It may be asked why the three cases of cancer of the cæcum, to which I have referred above, differed so much in symptoms from the two cases narrated at length. The important difference is this: that in the former cases the walls of the cæcum were the special seat of disease, and there was no real obstruction; whereas in the only one of the latter two cases which has terminated fatally the disease originated in the situation of the valve, and caused marked obstruction at this point, which was of course equivalent to obstruction of the lower end of the ileum itself.

I have said little as to treatment; and I have to acknowledge that I have very little to say. My patients were treated mainly with opium, either given by the mouth or administered subcutaneously, which I need scarcely say was of immense service in relieving pain and in restraining the violent movements of the bowels. As a general rule, the bowels acted pretty freely of themselves, but occasionally, when constipation had existed for a few days, and the excessive peristaltic action was in abeyance, a small dose of castor oil seemed serviceable and enemata afforded some relief.

Next as regards operative measures. My attempts to relieve by puncturing the bowels were not successful, and I am not sure that I shall try it again in such cases. For even though the bowels are distended and resonant on percussion, there is no doubt (I think), judging from the history of the cases, as well as from post-mortem evidence, that the chief distention is due to the accumulation of thin fæcal matter; and this suggests a possible source of danger. At any rate, the punctures, as a matter of fact, gave exit to very little gas, and afforded no relief. The most important question, however, is, Should an exploratory operation be performed? I am bound to say, looking back upon my cases, that I do not think an operation would have been of real benefit in any of them. It is extremely difficult, even at a post-mortem examination, to cope successfully with old adhesions causing very considerable matting together of bowel. Such difficulties must be greatly enhanced during life. I do not myself think that in either of my first two cases such a dissection

could have been successfully performed. In neither of the other three (I mean the case of narrowing of the lower end of the ileum, and the two cases of malignant disease) do I think an operation would have been of the slightest benefit; indeed, in the last it had to be abandoned. At the same time I am free to confess that, looking to the unamenability of these cases to medical treatment, to their almost certainly fatal outlook, to the possibility that some such cases may really be due to lesions capable of successful surgical treatment, and to the fact that abdominal section is now a comparatively simple and safe procedure, I should be disposed in most cases, if not to urge, at any rate to sanction, the performance of an exploratory operation.

THE TREATMENT OF DERMATITIS HERPETIFORMIS.[1]

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In the several communications on this disease that have been published by me during the past five years, no special remarks have been made concerning its treatment. The subject-matter of these papers has been largely confined to a statement of the cases observed with the view of setting forth the symptoms and the more important clinical facts, in the hope that the disease might become better known. A number of cases (perhaps ten or twelve) have been reported by me, and others have been observed in my private and public practice, so that now it seems appropriate that something be said about the treatment of this exceedingly rebellious disease. At the same time, I would state here that in many cases the remedies employed, both external and internal, seemed to exert but little or no beneficial effect. In severe cases, and especially during an exacerbation, no form of local treatment used appeared capable of making a favorable impression on the skin. In such instances the disease is the most difficult to influence of all the inflammatory affections, surpassing even inveterate eczema.

The internal treatment may first receive attention. The generally-recognized observation that the disease may arise from and be dependent upon several distinct or even diverse causes, precisely, for example, as occurs in the case of eczema, precludes positive statements as to remedies. Each group of cases, based on the etiological factors at work, requires special handling, and hence I believe no class of remedies can be recommended which would be suitable to all cases. The origin of the disease,

[1] Read before the American Dermatological Association, September 3, 1890.

where this is ascertainable, should ever be kept in mind, and the treatment be pursued in this direction on general principles. With a disease which in most instances is exceedingly persistent and chronic in its course, a speedy cure is not to be looked for, either from internal or local remedies.

I shall make my remarks as practical as possible and be brief. The local treatment may first be considered. It must be remembered that the disease, as a rule, is multiform in character, and that, as in the case of eczema, we have to deal with varied lesions, at one time erythema, at another vesiculation or pustulation. The several varieties of the disease, therefore, naturally call for different formulæ, certainly as to strength, and sometimes even for different remedies. Thus, my experience has shown that milder preparations are required for the erythematous than for either the vesicular or bullous, and I would here remark that this (erythematous) variety is the most difficult of all to control by local means, while the vesicular is the most easily influenced. It is not my purpose at present to take up the treatment of the several varieties of the disease specially, but rather to ask attention to the principles of treatment applicable to the disease as a whole. From a therapeutic standpoint the affection may be considered under the headings of acute, subacute, and chronic, the two latter stages being those we are generally called upon to treat. It must be kept in mind that the disease involves in most cases the greater part of the general surface; that therefore there is a good deal of cutaneous surface requiring attention, and that the remedies must be selected and prepared to meet that end. Another difficulty that we have to contend with is that the eruption tends to repeat itself in the form of more or less frequently recurring outbreaks or crops, a new one often coming out before the old one has disappeared, the skin thus being in a peculiar state, interfering with and complicating the treatment. It is this condition and the variety of elementary and secondary lesions generally present at the same time that render the treatment so difficult. Almost all the cases that have been under my observation have been chronic, and previously had undergone all manner of treatment; in some instances at the hands of competent dermatologists. Long experience has taught me that the disease is most difficult to control, and that some of the remedies from which good results might be looked for—such, for example, as are useful in eczema—exert but little or no influence in arresting the process. The milder so-called soothing preparations, as boric acid, calamine and oxide of zinc lotions, ointments, and pastes, sometimes so useful in acute or subacute erythematous and vesicular eczema, are of no value in this disease. I have long since arrived at the conclusion that the only class of remedies from which benefit is to be expected is stimulants, especially those which act revulsively. I will first enumerate a few of the more important substances

that have been employed. These are: Tar, in the form of oil, ointment, and alcoholic and alkaline tarry lotions; carbolic acid, sulphur, Vleminckx's solution of sulphurated lime, thymol, ichthyol, hydronaphthol, resorcin, and fluid extract of grindelia robusta. On account of the peculiarity of the eruption, including its multiformity, mixed acute, subacute, and chronic stages, and distressing subjective symptoms, it is difficult both for the patient and physician to estimate the value of any remedy. Such sufferers, moreover, are seldom content to remain long under the care of any one physician, hoping continually to derive benefit from frequent change of treatment. Of the remedies just referred to, the most valuable is sulphur, and in the form of ointment, about two drachms to the ounce. I was first led to employ it through the statement of a patient many years ago, who had derived more benefit from it than from any other substance. He had suffered long with the vesicular variety, and had sought the advice of many physicians without obtaining even temporary relief. On one occasion, in desperation, he rubbed himself vigorously with a strong sulphur ointment, made soft by the addition of walnut oil. This afforded immediate and gratifying relief, such as no other application had ever given, and, moreover, soon caused the eruption to disappear. On subsequent occasions he had again employed it, and he regarded it as the most valued remedy known to him. The remedy and mode of application seemed to me harsh and unlikely to succeed, but a trial proved satisfactory and bore out the statement made. My experience with it leads me to regard it as especially useful in the vesicular and pustular varieties, and also in the bullous, but that in the erythematous variety it usually proves irritating. Let me here say, however, that in some cases it has failed to act favorably, and I by no means wish to lay too much stress on its value, nor to put it forth as a specific. I merely desire to state that in the vesicular variety it is the best remedy that we are acquainted with. It should be applied with friction and with sufficient force to break down the vesicles, pustules, and blebs as speedily as possible. As already intimated, the ointment should be strong, about two drachms to the ounce, and should be used in the manner indicated, with the view of making a positive impression on the skin, by causing, as it were, local shock to the nerve-endings. The rubbing should be long continued and thorough. It is useless merely to smear it on, as the object by this means is not accomplished. In suitable cases acceptable relief to the itching and burning is usually obtained after one or two applications. Remedies of this class, I believe, are the kind from which most benefit is to be looked for. They should not be too harsh nor too stimulating in their action. The strength and the amount of friction must be regulated by the effect. They should be applied as early in the attack as possible, as soon as the lesions begin to form.

In some cases tar, especially in the form of the alkaline solution known as liquor picis alkalinis, is useful, especially in allaying the itching. It is, of course, to be diluted, one drachm to about eight ounces of water, according to the caustic effect produced. Another equally valuable tarry solution, and one that is safer to use, is that known as liquor carbonis detergens, an alcoholic solution of coal-tar. This also is to be similarly diluted, though sometimes it may be advantageously used strong, one drachm to from one to four ounces of water. Both of these preparations are useful in relieving itching, but I do not think that they exert much influence in arresting or modifying the progress of the eruption, and hence they can hardly be looked upon as curative. In the erythematous variety they prove of most value, because here the friction ointments are usually not tolerated. Ichthyol I have used in varied strength, in the form of ointments and lotions, and, as in the case of tar, the latter have proved more serviceable, but the remedy is not so efficient as tar. Nor can I speak favorably of resorcin, thymol, and carbolic acid. The last-named remedy, especially, has proved less useful than one would expect, considering its well-known powers in other allied inflammatory states of the skin. Of the various remedies and combinations which have been employed on various occasions none can be specially recommended, and hence they need not be enumerated. Baths, for the most part simple and hot, have been used with some benefit in relieving the burning and itching. A patient exhibiting the erythemato-vesicular variety, recently under my care, regarded a hot bath of an hour's duration at night as grateful, but he did not seem to sleep better than when it was omitted. The same patient had, during a previous severe attack, endured a fortnight's experience with the continuous bath, which had afforded a certain amount of ease and comfort, but had not proved in any degree curative.

Concerning the internal treatment not much that is favorable can at present be said. With a disease tending to pursue an emphatically chronic course, speedy cure is hardly to be expected. This observation is borne out by experience. Several cases under my notice some years ago recovered in a short time under, for the most part, internal treatment, but I am not prepared to state that the cure was due to the remedies used. In the relapsing and obstinate form, relief is to be obtained, I believe, only from such remedies as favorably impress the nervous system. The cutaneous symptoms are such as point distinctly to the neurotic nature of the disease. The eruption, as a whole, possesses features in common with the well-known and established neurotic inflammatory diseases, such as herpes simplex, herpes zoster, herpes iris, and pemphigus. The nervous system, it may be centrally or peripherally, is undoubtedly in some manner and in a variable degree deranged, and it is to aid this important function that we must look in the choice of

remedies. Among such drugs I would first speak of arsenic, which in suitable cases offers, I believe, more hope of benefit than any other remedy. By suitable cases I mean more particularly the simple, uncomplicated chronic cases, whose history and cause are obscure, and not those manifestly due to a deranged uterus and the like. At the same time, from my experience and from that of some other practitioners with whom I have been in communication on the subject, it must, on the whole, be regarded as disappointing. No reliance can be placed upon it, and sometimes it seems rather to aggravate the disease. Upon inquiry I have found that most of the patients who have been under my observation had at one time or another previously taken a course of arsenic, and without experiencing much, if any, benefit therefrom. I may add that it has often been a matter of surprise to me how little influence, for good or for bad, it possessed over the disease. While, therefore, some cases seem to have been benefited, the majority have not been so, possibly, in some instances, because the drug had not been administered in sufficiently large doses. In one case, however, very large doses of Fowler's solution (as much as forty or fifty minims a day) were tolerated, and seemed for the time being partially to control the bleb-formation, but the results, upon the whole, were not beneficial. I believe it to be well worth a trial in the vesicular and bullous varieties, and the dose should be gradually increased. From the well-known power of arsenic to relieve and to cure some cases of true pemphigus, one would naturally look for good results in suitable cases of the disease under consideration, which is, without doubt, allied to the pemphigus process. As far as our knowledge of the treatment of dermatitis herpetiformis extends to-day, no other remedy offers so much hope of benefit in suitable cases, and the results, whether beneficial or harmful, should be duly chronicled with the reports of future cases. Of the value of quinine and strychnine, there is not much to be said beyond that they do not appear to possess any special power over the disease. The same remark may be made concerning certain other general remedies that have been employed—as, for example, iron, cod-liver oil, and ergot. In several cases that are called to mind, it was thought that the hygienic influences of change of air and scene might prove beneficial by giving tone to the nervous system, but in this the results were not commensurate with the trouble incurred. But I would by no means undervalue both moral and hygienic treatment, both of which should receive full consideration, for experience with this disease shows that in most cases general physical and mental depression are conspicuous features.

A CASE OF CYSTITIS, WITH THE FORMATION OF A THICK EPIDERMAL SHEET IN THE BLADDER— PACHYDERMIA VESICÆ.

By A. T. Cabot, A.M., M.D.,
of Boston.

The following case was reported before the American Association of Andrology and Syphilology, at their fourth annual meeting, in the hope that some member of the Association could put the writer on the track of the report of similar cases. None of those present had seen or known of such cases, except Dr. J. A. Fordyce, of New York. He brought to the meeting photo-micrographs obtained from sections of the bladder and ureter of a patient that he had seen on the autopsy table in Vienna, but of which he could give no clinical history. The condition shown in these photographs was exactly similar to that found in the case which forms the text for this paper, and one of them has been accordingly reproduced here (see Fig. 1).

Fig. 1.

Photogravure reproduction from a photo-micrograph of a dermoid sheet in the ureter. The sheet of epithelium lies on the connective tissue below with papillæ running up into it. Some exfoliation is shown on the surface. (From Dr. Fordyce.)

Dr. Fordyce also called the writer's attention to an article by Posner in Virchow's *Archiv*, upon "Dermoid Changes in Mucous Membranes," and it is to this article and other German investigations referred to by Posner, that this paper is indebted for the pathological consideration of the subject.

The following is the clinical history of the case:

The patient, James E. B., was a strong-looking man aged forty years. In 1870 he was cut for stone by the lateral perineal method. The wound healed in about three weeks, leaving no fistulous track. Always after

this time urination was more frequent than normal. Five years ago, he had an attack of acute cystitis, accompanied by much pain; and from that attack the bladder never wholly recovered, giving him at times much trouble, but never, until the present illness, compelling him to stop work.

In the middle of June, 1889, when feeling quite well, he had a sudden stoppage of water. For this he saw a doctor, who passed an instrument into the bladder, with some relief of his symptoms; and, shortly after, he passed a small phosphatic stone. He had severe pain for a week, and this continued, though somewhat less in degree, up to the time that he was seen by the writer, on August 2, 1889. The pain was felt just before, during, and after passing water, and lasted for about a minute after the act of urination was finished. Occasionally a few drops of blood came in the last part of the stream. The urine was loaded with mucus and pus, and contained many pavement epithelial cells, both singly and in clumps; it was usually colored somewhat by the presence of blood; it passed in a fairly good stream.

An examination with a sound at this time did not find a stone, but showed a slight narrowing in the deep urethra, at the site of the old operation. There being but little improvement under treatment, he was sent to the Massachusetts General Hospital for a more thorough investigation under ether.

In this examination the sound failed to touch a stone or any calcareous matter, but, after the exploration, a washing with the Bigelow evacuator brought away several small papillomatous-looking masses. These bits were examined by Dr. W. F. Whitney, who reported that they were composed of papillary masses of epithelial cells mixed with lime salts; and, though they did not have the branched forms common in papillary growths in the bladder, it seemed probable that they came from a papillomatous tumor.

It was, therefore, decided to do a suprapubic cystotomy to remove the growth; and this operation was done on September 5, 1889. The Garson-Peterson method was followed. The bladder held seven ounces of boracic solution, and the rectal bag was distended with about fourteen ounces.

On opening the bladder, the posterior wall was seen to be of a whitish-yellow color, and to the finger it felt stiff, and was rough on the surface. The rest of the bladder-wall was normal in appearance. It was presently found that a thick membrane could be detached from the diseased surface, and, with care, could be peeled off with the fingers in sheets of one or two square inches area. It was loosely attached, and after removal left a smooth surface, which bled but slightly. The wall of the bladder which it left felt soft and supple.

This membrane having been removed as thoroughly as possible, the bladder was drained by a double rubber tube carried to the bottom of the cavity, and an antiseptic dressing was applied.

The operation was followed by very little fever or discomfort, and the wound did uninterruptedly well. On the fourth day one tube was removed and a catheter was tied in through the urethra. On the ninth day the remaining tube was taken out, and the wound rapidly closed; so that, on the eighteenth day, the catheter was finally left out, and the patient passed water by natural efforts.

Urination was now quite frequent, and the urine showed a large trace of albumin and contained considerable ropy pus with an admixture of blood. This condition of the urine improved quite rapidly under the

daily injection of a solution of nitrate of silver, one grain to three ounces, and, at the same time, the capacity of the bladder steadily increased.

The patient finally left the hospital on October 31st, at which time he could hold his water for from one and a half to two hours, the bladder having a capacity of about four ounces. There was still quite a large amount of sediment in the water, which consisted chiefly of mucus, but which for some days had begun to contain a number of epithelial flakes similar to those noticed before the operation.

After leaving the hospital, he continued the bladder irrigation, using a boracic solution twice a day; and every second day, in addition to this, he injected the bladder with a solution of nitrate of silver, two grains to the ounce, taking care afterward that this wholly escaped.

Under this treatment, supplemented by the occasional passage of sounds to keep the deep urethra properly dilated, he slowly improved, gaining both in power of holding water and in general condition. During the winter he took turpentine for a time, which cleared the urine somewhat; and, later, under the moderate use of sandal oil, the improvement was still more marked.

In May, 1890, he was finally able to resume hard work. He then weighed as much as he ever did. The urine still contained considerable sediment, but it was of a light flocculent character and there was no appearance of blood. There were whitish clumps of epithelium in it, but these were lighter in texture and not so large as the solid white masses that it formerly contained.

A thorough rectal examination was made at this time, but nothing abnormal could be detected about the posterior bladder-wall.

In August, 1890, he continued well, and the urine no longer contained any of the epithelial flakes or clumps. It was still somewhat cloudy from a slight admixture of mucus.

The membrane removed at the operation covered an area of about forty-five square centimetres, and when fresh was from two to three millimetres in thickness, varying within these limits in different parts.

Fig. 2 shows very well the microscopical appearance of a cross-section of this membrane. It is composed of epithelial cells, which are arranged much as they are on the surface of the skin.

In the deeper parts they are penetrated by papillæ of connective tissue, and the cells are square or rounded, while, as the free surface is approached, the cells become flattened like ordinary epidermal cells, and on the surface they are being exfoliated in ragged flakes. In places, near the surface, there are well-marked onion bodies, or epidermal pearls; but at no part are these to be found in the lower layers of the epithelium.

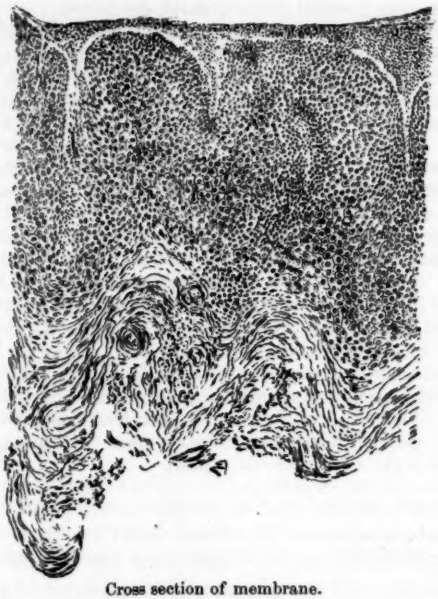
There is, in the lower part of the horny epithelium, a well-defined stratum of cells containing kerato-hyalin—which is a proof, if any were needed, that these are true dermoid cells.

At no place is there any apparent tendency of the epithelial elements to burrow down into the connective tissue beneath, after the manner of a cancer.

The mucous membrane of the bladder is normally covered by several

layers of epithelial cells, which in the deep parts are more or less rounded, and on the surface are flattened. Krause and Oberdieck[1] describe four layers of epithelium; and the latter has determined the thickness of the epithelial portion of the mucous membrane to vary between 0.036 and 0.068 millimetre in the empty bladder, and to be about one-half to one-third as thick in the full bladder.

Fig. 2.



Cross section of membrane.

The epithelial layer forms a flat sheet on the connective tissue beneath, and has no papillary arrangement such as exists in the deep layers of the skin.

The membrane in the case reported, which was made up entirely of epithelium, was therefore from fifty to one hundred times as thick as the epithelial layer normally existing on the bladder-wall, and its nourishment was provided for by papillæ thrown up by the connective tissue below.

These papillæ are entirely unusual in this locality, yet they nowhere showed any tendency to go beyond limits of growth that are physiological in other parts of the body. There was at no point any formation of extremely long, branched papillæ, such as are seen in papillary growths of the bladder. In short, the condition resembled the hyperplasiæ that are met, not uncommonly, on other epithelial surfaces as the result of

[1] Ueber Epithel u. Drusen der Harnblase, etc. Göttingen, 1884.

long-acting irritations. On the skin we have corns and callouses, due to a pathological process almost exactly identical. There is, however, this difference, that whereas in the skin we have a simple hypertrophy of the horny layer which is normally present on that surface, we here have the formation of a highly-developed horny layer on a surface on which true epidermal cells do not normally exist.

Virchow[1] has described a similar condition of the mucous membrane of the larynx, which he has named "pachydermia laryngis." He has shown that, when the mucous membrane of the larynx is exposed to persistent irritation, the epithelium may become much thickened into many layers and cornified, while papillæ are thrown up out of the connective tissue below. This change he noticed only on those parts of the larynx where the epithelium is of the pavement variety. And he regards those parts of the laryngeal mucous membrane which normally have pavement epithelium, as allied to the outer skin, and, therefore, subject to changes and pathological processes such as are met with on the skin, while the portions of the larynx which are covered with ciliated epithelium—*i. e.*, the more properly mucous surfaces—he thinks, are not subject to these changes.

Posner[2] points out, however, that the kind of cell on a given surface is not a reliable guide in determining the relation of that surface to others which seem to resemble or to be allied to it. Thus the nasal cavities, which are infoldings of the ektodermal layer, and are, therefore, allied to the outer skin, are covered with ciliated epithelium and are plentifully supplied with mucous glands—in short, are covered by a true mucous membrane.

Posner, therefore, divides the question of the cornification of mucous membrane into two parts: (1) Can mucous surfaces covered with cylindrical cells undergo dermoid changes? And (2) Can surfaces of a meso- or ento-dermal origin take on a dermoid character?

The first of these questions he answers easily in the affirmative, and brings forward in proof many observations showing the change of cylindrical epithelium into dermoid cells.

The second question is, however, the one that particularly interests us in connection with our cases; for the bladder, being derived in the embryo from the sinus urogenitalis, is distinctly of entodermal origin, and has no close relationship, therefore, with the external skin.

In the consideration of this question Posner points out the frequent occurrence of the dermoid change on the mucous membrane of the upper portion of the vagina in cases of prolapse. Similar changes are also observed in the uterus, in the larynx, and in the male urethra. It

[1] Berl. klin. Wochenschrift, August, 1887.

[2] Virchow's Archiv, vol. cxviii., 1889.

is to be remembered, however, that the anterior portion of the urethra—*i. e.*, all of the canal anterior to the constrictor urethræ muscle—is of ektodermal origin, being formed by an infolding of the outer epithelial layer, so that only when dermoid changes are found in the deep urethra can they be regarded as occurring on mucous membranes of entodermal origin.

When we come to the bladder we find instances of dermoid changes extremely few and doubtful. V. Antal has reported a case of epithelioma of the bladder in which all the histological characteristics of the outer skin were observed. Even the kerato-hyalin layer was there. Posner justly says, however, that great care is necessary in such cases, to be sure that the tumor is primary on the mucous membrane. He also quotes a case of Marchand's[1] to show to what extent the epithelium of the skin may grow over onto the mucous membrane of the bladder. In this case, a boy with a perineal fistula following lithotomy, had the bladder, the ureters, and the pelves and calices of the kidneys covered with a lining of horny epithelium which had grown in from the skin.

These are the only instances that Posner has been able to find of epidermal changes of the mucous membrane of the bladder. He considers neither of them as clear examples of a change (umwandlung) of the vesical mucosa into epidermis, but rather as instances of transplantation or of direct growth of epidermis onto the bladder by continuity of tissue.

Whether the case presented with this paper can be accepted as an undoubted instance of the bladder mucous membrane undergoing an epidermal change must be decided by the consensus of opinion of those best able to judge.

The fact that the patient had a lithotomy many years before, introduces the doubt whether here we have not a case of the growth of the epidermis of the skin over on to the mucosa of the bladder. It is to be remembered, however, that the perineal wound was open for only three weeks, that it then healed solidly and smoothly, and that there is now no dipping in of the skin, such as is seen in cases of old fistulæ.

It seems to the writer that this rapidity of healing precluded the possibility of any continuity of growth of epithelium between the skin and bladder, such as occurred in Marchand's case.

Furthermore, the clinical history of this case seems to throw some light on the etiology of the affection. After the operation the clumps of epithelium exfoliated from the dermoid surface reappeared in the urine, persisted, though in diminishing amount, for more than six months, and only finally disappeared after about ten months. This would seem to show that the dermoid condition continued over portions of the

[1] Naturforscher Versamlung zu Wiesbaden.

bladder-wall, and was finally so modified by treatment that all evidences of it vanished.

The nitrate of silver injections were not of a strength to destroy epidermal tissues, and no other part of the treatment could be supposed to have any power to effect the destruction of this membrane.

All of the treatment was directed against the cystitis, and the disappearance of the dermoid flakes coincidently with the mitigation of the inflammation in the bladder would suggest that the dermoid condition was induced by the irritation of the cystitis, and disappeared *pari passu* with the cessation of this irritation.

Virchow has shown that *pachydermia laryngis* has resulted from not unsimilar irritations of the mucous membrane of the larynx, and the writer is inclined to the view that in his case the dermoid change in the bladder was a result of the chronic cystitis.

In making a diagnosis of this condition in future cases the points to be taken into consideration are the chronic character and obstinacy of the cystitis, and the presence in the urine of flakes and clumps of horny epithelial cells.

It seems quite possible that a pachydermia vesicæ exists not infrequently in a less degree than in the case reported and goes unrecognized. The appearance in the urine of considerable numbers of flakes of epithelium is not uncommon in the course of severe cystitis, and that the dermoid condition should not be recognized on the autopsy table may well be due to the maceration which the epithelium rapidly undergoes after death. This is so great that in order to obtain correct ideas of the condition of the epithelium in a normal bladder it has been necessary to inject the bladder immediately after death with absolute alcohol to fix the cells and prevent their separation. The present more frequent performance of suprapubic cystotomy will probably give us opportunities to recognize this dermoid change during life.

With the cystoscope the whitish color of the surface might perhaps be appreciated, and in places where the edge of the membrane was sharply defined, characteristic pictures might be obtained. It would probably, however, be very difficult to distinguish this condition from some of the yellow surfaces furnished by tuberculous ulcerations of the bladder.

As far as we can judge from this one case, the treatment of a similar condition should be directed to the allaying of the inflammation. Certainly the injections of nitrate of silver seemed to answer an excellent purpose. And every measure that allayed the irritation and enabled the patient to carry his water longer and to urinate with less pain was followed by a corresponding diminution in the amount of pus in the water and in the number of epithelial flakes.

Dr. J. P. Bryson, of St. Louis, suggested the possible utility of injec-

tions of salicylic acid solution. He said that he had had excellent results from the use of these solutions in the treatment of cystitis, and he thought they would be peculiarly applicable in cases of this sort, for salicylic acid has the well-known power to remove warts, corns, and other growths of hyperplastic epithelium.

If milder methods of treatment fail, and resort to operation seems indicated, the suprapubic section affords the only satisfactory method of dealing with the membrane; for its separation and removal by the limited route through the perineum are manifestly impossible.

THE TREATMENT OF ARTERIO-VENOUS ANEURISM, WITH TWO CASES TREATED BY EXTIRPATION.[1]

By B. Farquhar Curtis, M.D.,
ATTENDING SURGEON TO ST. LUKE'S HOSPITAL AND TO THE NEW YORK CANCER HOSPITAL.

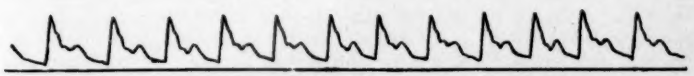
Case I.—John S., twenty-eight years of age, single, a factory-hand, born in the United States, was admitted to my service at St. Luke's Hospital, December 20, 1889. The patient's family history was good, and he had always enjoyed good health. Four years before he had contracted syphilis, but it had never affected him seriously. Thirteen years before, he was shot in the right leg with a pistol ball of .22 calibre, entering (from the left side) near Hunter's canal, and remaining in the tissues. The leg swelled at once after the injury, and he could not walk for two months, but he never felt any pain. One year later he first noticed a pulsation in the popliteal space, and thinks that he discovered a thrill at the same time, but the limb occasioned him no trouble, and he worked and walked as usual. One year ago the veins in the leg became greatly swollen, œdema of the leg and foot appeared, and ulcers formed on the leg, which caused him great pain. His condition gradually grew worse, and last week the pain kept him awake at night.

Examination: The right lower extremity is much increased in size, and six inches above the patella it measures 19½ inches in circumference as against 15½ inches in the left; and below the tuberosity of the tibia the right leg measures 15¼ inches in circumference, while the left measures only 11½ inches. The veins of the entire extremity are distended and very numerous, and strong pulsation can be seen in the superficial veins about the knee and over the thigh—except on its inner and upper surface. Below the knee there is no pulsation in the veins. The venous distention and pulsation are most marked on the outer side of the thigh, even as high as the great trochanter. When the soft parts of the thigh are pressed between the hands a strong expansive pulsation is felt. The skin of the leg is of a dark bronze color, thickened and scaly, and there is an ulcer one-half of an inch in diameter, and of chronic appearance, situated on each side of the leg near its middle.

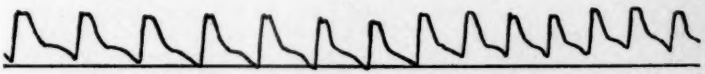
[1] Read before the New York Clinical Society, April 28, 1890; second case reported December 26, 1890.

There is a faint scar at the point where the patient says that the bullet entered—near Hunter's canal.

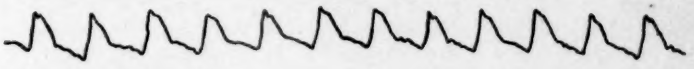
There is a general expansile pulsation visible in the popliteal space, and the skin here is œdematous, but no well-defined tumor can be made out. A very strong pulsation can be seen and felt along the femoral vessels, and extending over Poupart's ligament, where a pulsating tumor can be felt over the external iliac vessels, about the size of a hen's egg. It is impossible to distinguish between the pulsation of the artery and that of the vein. There is a very strong thrill to be felt over the popliteal space, and this thrill is conducted upward along the femoral vessels into the tumor above Poupart's ligament, and it is also to be felt in the superficial veins of the thigh, but not in those below the knee. This thrill is continuous, but its intensity varies with the arterial pulse, being most marked at the apex of the pulse-wave. Corresponding to the thrill a loud, rough murmur can be heard over the same area by bringing the ear into contact with the leg, but not at a distance; the murmur is also continuous, its intensity varying with the pulse-wave,



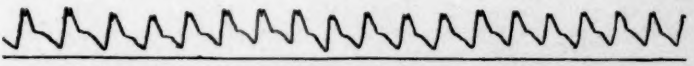
John S. Right radial; pressure 3¼ ounces. January 18, 1890.



Over tumor in popliteal space; pressure 2½ ounces.



Over tumor on inner aspect of thigh; pressure 3 ounces.



Femoral, 6 inches below Poupart's ligament; pressure 3¼ ounces.

and has all the characteristics of the murmur heard in arterio-venous aneurism. One of the surgeons who examined the patient thought that he could detect pulsation and thrill in the anterior tibial artery, and perhaps on that occasion some unusually favorable position of the limb rendered this possible, but none of the other surgeons were able to recog-

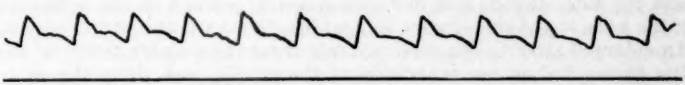
nize any peripheral pulse in spite of frequent and careful examination. Pressure upon the femoral artery below Poupart's ligament, or at the apex of Scarpa's triangle, stopped the pulsation and thrill in the popliteal tumor, and at the same time the tumor above Poupart's ligament grew smaller and lost its pulsation. Very forcible pressure was necessary to control the pulsation of the vessels in any part of their course. The strongest pulsation, thrill, and murmur were observed to be situated on the outer side of the popliteal space—not over Hunter's canal.

The patient was kept in bed for a fortnight, during which the extremity grew much smaller and the ulcers healed. A distinct tumor could then be recognized in the upper and inner part of the popliteal space, toward Hunter's canal, about the size of a hen's egg. The heart-sounds were normal and the apex-beat lay three and a half inches to the left of the median line and external to the nipple.

Operation, January 20, 1890. The patient was etherized and Esmarch's bandage was applied to the thigh, after a rubber bandage had been fastened around the leg below the knee (to form a reservoir of blood to facilitate dissection), and leaving also the blood in the sac and its neighborhood. All of the very numerous vessels crossing the incision were divided between double ligatures. Drawing the nerve to the inner side, we reached the tumor, which filled the entire popliteal space, and was found to consist of the popliteal vein, immensely distended, and forming a sac three and a half inches long and one and a quarter inches in diameter, the distended part passing quite suddenly at each end into the vein of normal size. The sac was not adherent anywhere, and it was easily enucleated from the surrounding tissues, there being but one small branch given off from the vein (on its anterior aspect) in the whole length of the distended portion, until the upper angle of the popliteal space was reached. At this point the communication between the artery and vein was found, and such a sheaf of branches was given off from the latter that it was necessary to enlarge the incision upward for three inches (a total of seven inches) before the true relations of the parts could be ascertained. It was finally made out that the artery and vein were connected by a short passage, about a quarter of an inch long and of about the same diameter, with walls of the thickness of the arterial walls, about half an inch below the ring in the adductors, and that, directly opposite the opening in the vein, six or seven branches sprang from the latter by a common trunk, the combined area of their openings being fully equal to the calibre of the vein itself. This short venous axis was directed outward, and this fact explained at once why the pulsation and thrill had always been so strong under the outer hamstring. Besides these vessels, there were others given off from the external and anterior surfaces of the vein, and a large vessel arose from the short channel of communication between the artery and vein, passing downward and appearing to be one of the muscular arterial branches. The dissection was made very difficult by the tangled mass of veins, but finally they were all secured. The artery was ligated above and below the point of communication, and about half an inch of it was cut away, including this point. A small branch of the artery just below also required ligation. The vein was secured above and below the dilated part, and the latter excised. The Esmarch constrictor was removed, and so thoroughly had even the smaller vessels been secured, that only two or three more ligatures were required. The

artery was of normal size, and its walls of normal thickness, so far as it was exposed in the wound, while the veins were all enlarged and their walls much thicker than natural. A drainage-tube was inserted and the wound closed with catgut sutures. When the dressing was completed, a very faint capillary circulation was found to be present in the toes, as was shown by the return of color when the blood was pressed out of them. The circulation improved daily, and became natural by the fourth day, and on that day the sensation in the foot, which had previously been rather blunted, appeared to be normal.

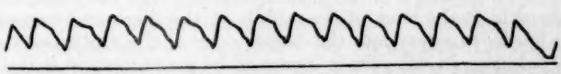
About two weeks after the operation, when the wound had healed, and after the patient had been sitting up for a day or so, about a drachm of pus was discharged from the upper angle of the wound, apparently coming from a considerable depth.



John S. Femoral, 5 inches below Poupart's ligament. February 25, 1890.

February 26th, the patient was discharged. The right thigh then measured 18 inches in circumference at the groin, 15 inches at the junction of the middle and lower thirds, and 14⅜ inches above the patella. The right leg measured 12½ inches in circumference below the knee, and at the junction of the upper and middle thirds 11¾ inches. There was no pulsation to be felt in the popliteal space. A large artery courses down upon and external to the outer hamstring, very superficially, and the anastomotica magna can also be felt quite distinctly. Pulsation in the femoral and external iliac arteries is more forcible than natural, but less so than before the operation. There is still something of a tumor above Poupart's ligament, but it is much smaller and does not pulsate so forcibly. (In the following May, the condition of affairs was about the same.)

CASE II.—William McC., twenty-four years of age, single, born in New Orleans, a laborer by occupation, was admitted to St. Luke's Hospital, suffering from a crush of three fingers of his left hand, October 30, 1890. He has always enjoyed good health, and denies syphilis. About nine years ago, he was shot in the right knee, with a pistol, the ball of which entered on the inner side and emerged from the outer. A very large

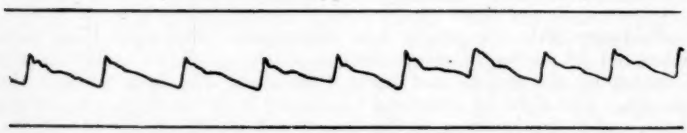


Wm. McC. Right femoral at Poupart's ligament. November 3, 1890.

pulsating tumor appeared at the point of injury (as large as the head of a young child, according to the patient's account), and he felt a strong thrill which extended up into his body. He had no surgical treatment,

but kept his bed until the wound healed. The tumor gradually diminished in size, and in a few weeks he was working as usual. Five years ago, he injured the skin over the right tibia, and since that time has had a succession of ulcers, which, although of small size, were very painful. He has a feeling of numbness and coldness in the right foot, and that limb is more easily fatigued than the other.

Examination of the limb shows an ovoid tumor between the internal condyle and the hamstring of that side, projecting one inch above the level of the limb, and measuring five inches vertically and two and a half transversely. This tumor pulsates strongly and expansively, and the skin over it is traversed with distended veins, which, however, do not pulsate. There is also a diffuse pulsating swelling in the popliteal space, more prominent externally, where the hamstring tendons appear to be flattened out over it. At the most prominent part of the first tumor, just above and behind the epicondyle, is a scar, where, the patient says, the ball entered; and in a corresponding position on the outer side of the knee is a slightly larger scar, which, he says, is the wound of exit. An enlarged artery is felt passing down along the anterior border of the first tumor and on the inner side of the patella, and along the outer



Left radial; 3 ounces. November 26, 1890.

Over tumor, outer part of popliteal space; 3 ounces.

From pulsating vein near saphenous opening.

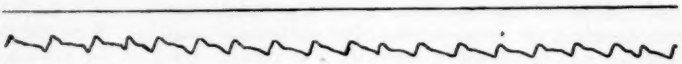
border of that bone is a similar vessel. The anterior and posterior tibial arteries cannot be felt. The veins of the leg and thigh are distended, but there is no pulsation in them, except in one large vein, which appears under the skin at the back of the middle of the thigh and turns around its inner border to empty into the deeper veins at the saphenous opening, and the pulsation in this vein is increased by pressure upon it just before it reaches that point, showing that it receives the pulsation distally. Over the tumor can be felt a very strong arterio-venous thrill, most distinct near the wound of exit, and the same thrill is felt in the pulsating vein just described, and at the saphenous opening, where it is nearly as strong as at the wound of exit. The thrill is not conducted into the

tissues surrounding the aneurism, but is felt along the great vessels of the thigh, although not so distinct as at the saphenous opening. A very loud and rough arterio-venous murmur is heard over the aneurism and wherever the thrill can be felt, and it is also transmitted through the tissues of the entire limb, being heard with the stethoscope in the sole of the foot. Pressure upon the femoral, anywhere from Poupart's ligament to Hunter's canal, will stop the pulsation, thrill, and murmur, and the artery can be compressed without the use of very great force. The right leg does not differ from the left in size, condition of skin, or hair, but it bears a very tender ulcer, about an inch and a half in diameter, in the midst of a scarred and pigmented area. There is no œdema, and the veins are not greatly distended.

The patient was kept in bed for some time, until the ulcer had practically healed, and he had recovered from the injury to his hand, and during this time the pulsation, thrill, and murmur diminished very noticeably. December 8th, it was noticed that there was no thrill in the tumor which projected between the condyle and hamstring on the inner side of the knee, and that it had also disappeared from the dilated vein described as emptying into the saphenous opening. Very slight pulsation was occasionally observed in a vein in front of the internal malleolus. No thrill could be detected in the vessels immediately above Poupart's ligament, in spite of the distinct thrill and loud murmur at the saphenous opening, and this circumstance, together with the fact that both were so much more distinct at that point than along the great vessels in the thigh, make it probable that they were intensified there by the cross current from the superficial distended vein, and were not conducted along the femoral vessels. The murmur was also less marked over the internal part of the tumor than in the popliteal portion.

Operation, December 11, 1890. Ether anæsthesia. Rubber bandage around the calf to secure a reservoir of blood below the wound to aid in dissection if necessary. Esmarch bandage applied to the thigh, leaving the sac free from compression. An incision seven or eight inches long was made over the popliteal space in the median line of the limb, extending up to the middle of the thigh. When the fascia had been divided, the entire popliteal space was found filled with the sac of the aneurism, and this was separated from the surrounding parts with a little difficulty, for it was somewhat adherent. The popliteal nerve was not seen during the operation. Some large vessels communicating with the sac were found on its outer aspect, lying quite superficially, and were divided between double ligatures. The lower end of the sac was then turned out of its bed and found to be divided into three lobes by deep grooves, the central lobe lying between the heads of the gastrocnemii. The internal lobe lay to the inner side and in front of the inner hamstring, which had formed the sulcus between it and the middle lobe. The external lobe lay under the outer hamstring, which was expanded over it, and was divided from the middle lobe by a groove formed partly by the tendons, partly by the vessels as they twisted around the sac. The entire sac was then readily dissected out, and it was found that the vessels already tied off were the popliteal artery and vein, which lay on the outer side of the sac, passing spirally around it, from their exit from Hunter's canal above and in front of the sac, to the middle of the popliteal space below and behind it. The remains of the vessels were sought

in the wound, and about an inch of each was removed in the neighborhood of their communication with the sac. The vessels lay side by side at their point of communication with the sac, and probably opened into it on their internal and anterior aspect by a common orifice. The specimen was injured at this point in the dissection, and it was impossible to ascertain their exact relationship. There were no other vessels opening into the sac. All vessels had been tied in the wound as they were divided, and only a few points required ligature after the removal of the Esmarch. The wound was closed by a continuous catgut suture, a gap being left in the middle of the popliteal space for drainage, and a small tent of iodoform-gauze was inserted into it. A pad of iodoform-gauze was placed next the wound and bichloride dressings applied. The entire foot and limb were wrapped in cotton. Even immediately after the operation was concluded, the circulation in the toes was fairly good, the blood returning quite promptly when pressed out by the finger, and the next day it was normal. The operation lasted two and one-half hours.



Femoral in Scarpa's triangle; 4 ounces. December 31, 1890.

The sac resembled the inverted human heart in shape, and measured when distended three and one-half inches from base to apex, three inches across its broadest part, and two and one-half inches in thickness from before backward. Its walls were formed of laminated cellular tissue and its shape also showed its origin as a diffuse (traumatic) varicose aneurism. The sac was partly filled with firm clot on the side opposite to its communication with the vessels. The vein was of normal size, the artery being also normal above, but contracted to about two-thirds of its natural diameter immediately below the point of communication with the sac.

The wound healed by primary union, except in its central portion, where the displaced tendon of the semi-tendinosus made some pressure. The patient feels well, and his ulcer has healed, but it is too early to say whether it is permanently cured.

William Hunter and Guattani first recognized the aneurisms connected with both arteries and veins, and explained their pathology, but we owe the name arterio-venous aneurism to Virchow. The division of these aneurisms into varicose aneurism (a sac connected both with an artery and with a vein) and aneurismal varix (in which a direct passage exists between the two, without the formation of a sac) originated with Scarpa. These subdivisions answer for the classification of most cases, but it is necessary to recognize an intermediate form in which the artery communicates directly with the vein, and there is no separate sac, but in which the vein is so greatly distended at the point of communication as to form a sac—a variety of which my first case is an example, and which has been especially described by the French authors.

Although these aneurisms belong anatomically to the class of aneurismal varix, they are clinically similar to varicose aneurisms, having the same tendency to growth and liability to rupture.

When a communication has been established between an artery and a vein, the walls of both vessels undergo certain changes, and their calibre alters, and these changes are of great importance in considering the safety of applying a ligature to the artery, and to the vein as well. The older writers undoubtedly exaggerated the extent and frequency of these changes. The veins, as a rule, are distended, although not always, and their walls become thickened. According to the majority of authors, the calibre of the artery above the site of the communication becomes enlarged, but Bramann expressly states that the artery generally remains normal unless endarteritis is present. As no one else appears to have analyzed the reports of so large a number of cases as this writer, I have carefully sought the original records of his cases as far as they were accessible, accepting his own summary when they were not, and have analyzed thus 81 cases in which an operation or an autopsy allowed the vessels to be examined. The condition of the artery is noted in 33 cases, in 19 of which the calibre of the vessel was enlarged above the communication with the vein, and in four others both above and below. In 10 cases it is expressly stated that the vessel was not enlarged above, in 5 of which it is also said to have been healthy below. In 7 cases, moreover, in which the artery was enlarged centrally, it was not enlarged peripherally. The presence of endarteritis is mentioned in only two of the cases. In 3 cases it is stated that the artery was contracted beyond the aneurism. It would appear from this showing that Bramann is incorrect in his assertion, and that the commonly-accepted opinion that the artery is frequently dilated above the aneurism is much nearer the truth. On the other hand, in reading the reports of recent operations, I have been much struck by the fact that the artery was found to be normal in so many cases, as it certainly was in my first case. In my second the artery was normal above, but contracted below. Perhaps this difference is due to the fact that the operation is now performed before the changes have progressed as far as they were formerly allowed to go. The cause of this enlargement of the artery is unknown, and as we do not even know as yet whether the blood-pressure at this point is increased or diminished, we must wait for more knowledge before a satisfactory theory can be framed.

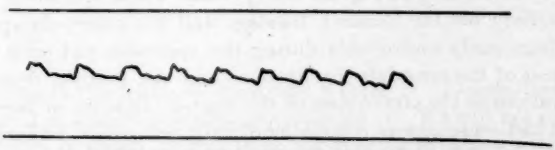
As to the condition of the artery beyond the aneurism, the figures already given show that it is generally normal, but that it may sometimes be contracted, even when it is dilated above. But there are four exceptional cases in which there was a general enlargement of the peripheral artery and its branches. One of these we can explain by general atheroma, as the aneurism was originally arterial, becoming vari-

cose by perforation of a vein. In two other cases the temporal artery was involved, and, although we cannot assume the presence of atheroma, for one patient was only eighteen years of age, the liability of this vessel to form cirsoid aneurisms may account for the change. The fourth case was Dupuytren's, occurring in the thigh of a young man who was wounded six months previously, at the site of the aneurism, in Hunter's canal—and it is totally inexplicable. The opinion that the artery is usually contracted below, appears to have been formed from the fact that the peripheral pulse was weaker than normal, but this is an unreliable sign, for the pressure of the tumor might cause a diminution of the pulse-wave, even when the artery retained its normal calibre. The mere loss of blood by leakage into the vein may cause a weakness of the peripheral pulse, as is very beautifully proven by the case of Müller (*Archiv. f. klin. Chir.*, xv., 1873), in which a soldier was wounded in the left arm, near the axilla, by a rifle-ball, and an aneurismal varix formed without a tumor, but with great distention of the superficial veins. Six months after the injury, the radial pulse could not be felt unless pressure was made so as to prevent the flow of blood from the artery into the vein, when, with the cessation of pulsation in the veins, the radial pulse became distinct, only to disappear again on removal of the pressure. Eighteen months later the condition remained the same, showing that an artery can remain of normal calibre for years, even if its usual blood-supply is very much reduced, and also that absence of the peripheral pulse does not prove diminution of the calibre of the vessel at that point.

As the artery dilates, its walls are apt to grow thin, and some would ascribe the thinning of the arterial wall to the diminished blood-pressure, but it is by no means certain that the arterial pressure is less than normal, and in some cases it is apparently greater—certainly an increased force of pulsation of the artery is a very frequent symptom. The sphygmographic evidence, which might throw light upon this point, is not yet extensive, but so far as it goes it favors the idea of an increased blood-pressure in the artery. Dr. Keen has published a tracing from the radial artery in a case of arterio-venous aneurism of the flexure of the elbow, before and after the operation, and it shows a much more forcible beat on the diseased side before the operation, the difference between the two sides disappearing almost entirely after the operation. Richet also found a similar difference between the two radials in a case of arterio-venous aneurism of the bend of the elbow, in which the tracing was made by the celebrated Marey himself—but unfortunately no tracing was made after the operation. These cases, then, indicate a rise in blood-pressure in the artery beyond the aneurism, and imply that the obstruction to venous return of the blood may project itself into the artery through the capillary system even although the

latter does not show any signs of it. The evidence of these cases is not weakened by such cases as that of Müller already quoted, in which the radial pulse was lost on the diseased side, for the seeming contradiction can undoubtedly be explained by differences in the size or position of the communication between the vessels, or in some other mechanical conditions.

There is also evidence of increased pressure in the artery *above* the aneurism in some cases. Ebenau's tracings in Czerny's case (*Berlin. klin. Wochenschr.*, 1883, 19) of a small aneurism in Hunter's canal, taken (it was supposed) over the femoral vein, probably give a combination curve of both artery and vein. It is a very remarkable curve, with a broad apex indicating a high blood-pressure. In my cases, Dr. Joseph A. Blake and Dr. L. F. Warner, house-surgeons of the hospital, made tracings with Dudgeon's sphygmograph from the popliteal tumor itself, from a dilated vein, and from the femoral vessels; it was impossible to distinguish between the artery and the vein. As no peripheral pulse could be felt, no tracings could be made beyond the aneurisms. All the tracings are very similar, showing an arterial curve of high tension with a broad apex—in the first case made up of two sharp points. In tracings made after the operation, these peculiarities are absent. One might be tempted to explain the double apex as due to pulsation in the vein immediately following that in the artery, but as the same characteristic is found in the tracing made over the tumor, I think we must attribute it to a vibration of the lever of the instrument on an unusually broad apex, due perhaps to the very forcible pulsation of the vessels.



Case of Dr. R. F. Weir. Femoral above the aneurism.

Dr. Robert F. Weir has kindly given me permission to show a tracing made in an unpublished case of his by Dr. Ellsworth Elliot, Jr., also with Dudgeon's instrument. The aneurism was a small sac connected with the anastomotica magna artery and vein, and the tracing was made over the femoral vessels above the tumor.[1] The curve is similar to that in my cases. It is interesting to compare the curve over the sac in my cases with that obtained by Bramann in v. Bergmann's case of axillary aneurismal varix, the latter being a purely arterial curve. On the whole, although the tracings indicate increased tension in the artery

[1] A lad of fourteen years, who had wounded himself with a sharp iron rod four weeks before. Extirpation. Cure. Sac nearly one inch in diameter.

above the aneurism, they differ so much that we need more material before any definite conclusions can be drawn from them.

The symptoms and diagnosis of arterio-venous aneurism require but slight notice here. The signs which are spoken of by most authors as invariably present, and which are certainly pathognomonic when they are found, are the thrill and murmur. But the thrill is sometimes absent, and the murmur may be of the ordinary arterial bruit type, so that such careful observers as Czerny and Annandale thought that they had to deal with arterial aneurisms until the true nature of their cases became evident during the operation. No particular cause was discovered which would account for the absence of these important symptoms in their cases. Perhaps the sphygmograph may help us in the future. If it were proposed to apply the Hunterian ligature in such a case, on the supposition that the aneurism was of the arterial form, the mistake would be a very serious one, for this method of treatment is a very dangerous one in arterio-venous aneurism.

Treatment.—Arterio-venous aneurisms have proven peculiarly recalcitrant to the simpler means of treatment, and, owing to their relatively good prognosis, surgeons have dreaded to undertake the more serious operations by which alone they could be cured. But if the records of these operations are examined, it becomes evident that the principal dangers incurred are such as have been greatly diminished by the advances of modern surgery. The older surgeons were certainly justified in thinking that the evils of this condition were seldom sufficient to justify exposing the patient to the dangers of primary and secondary hemorrhage, gangrene and pyæmia, which operations at that time implied; but the Esmarch bandage and the artery-clamp render hemorrhage easily controllable during the operation, and with the improvement of the materials for ligatures and the freedom from septic complications in the after-course of the wounds, ligature of large veins without bad consequences is a matter of daily occurrence, and secondary hemorrhage and sepsis have become rarities, so that the views of modern times have changed very considerably, and operations have become more frequent.

Compression.—Compression has failed, as a rule, in these aneurisms, except in cases which were treated very early and in which superficial vessels were involved. Pressure has generally succeeded only when applied so as to occlude the opening between the artery and vein while it was also exerted on the artery above. In some cases the aneurism was converted into the arterial form and then completely cured by the Hunterian ligature. Among 26 cases of reported cures by compression collected by Bramann, 20 were in the brachial, 2 carotid, and 3 femoral. (Note that his lists give a total of 63 cases of brachial arterio-venous aneurisms, and 46 femoral and popliteal cases.)

The methods of galvanism and of injection of coagulating substances into the sac are totally inadmissible in these cases, although there have been a few instances of cure by these means, for the danger of embolism is very great on account of the direct communication between the sac and the vein, and I am surprised to find that so good an authority as Holmes still admits them to a place among methods worthy of trial.

Hunterian ligature.—The results of the single ligature applied above the lesion,[1] generally after the Hunterian method, for this form of aneurism, have been very bad. Van Buren collected 24 cases, and adding to them the cases in Bramann's list, which were so treated, and a few from other sources, I find the following results:

CASES OF HUNTERIAN LIGATURE FOR ARTERIO-VENOUS ANEURISM.

VESSEL.	Gangrene occurred.	RECOVERED.			Died.	Total cases.
		Cured.	Improved.	Unimproved.		
Common carotid	...	...	2	1	4	7
Subclavian	...	...	...	...	2	2
Brachial	2	4	...	9	6	19
Common iliac	1	...	...	...	2	2
Internal iliac (gluteal)	...	1	...	...	...	1
External iliac	4	...	...	2	5	7
Common femoral	2	1 (amputated)		...	1	2
Femoral superficial	2	1	...	6	3	10
Anterior tibial	...	1	...	...	...	1
Totals	11	8	2	18	23	51

According to this table, we have only 8 cures in 51 cases, including 1 case saved by amputation after gangrene set in. We will not consider the mortality as shown by this table, for in order to collect a sufficient number of cases it was necessary to use very old ones, and the most frequent causes of death were sepsis and secondary hemorrhage, and will only note that the operation failed to cure one-third of the cases. But I wish to draw attention to the great frequency of gangrene as compared with the same operation performed for arterial aneurism. That both cases of ligature of the common femoral caused gangrene is not surprising, but note that there were 2 cases of gangrene in 19 ligatures of the brachial, 2 in 10 of the superficial femoral, and 4 in 7 of the external iliac. Gangrene after ligature of the brachial is an exceedingly rare accident, and in 77 cases of ligature of the femoral for popliteal aneurism Holmes (*System of Surgery*) found only 3 cases of gangrene,

[1] Of course the single distal ligature has never been applied to these aneurisms.

while Norris (American Journal of the Medical Sciences, 1847, xiii. p. 13) found 11 cases of gangrene in 95 of ligature of the external iliac. These facts have completely condemned the operation for use in the extremities, and the high mortality of the operations in the neck condemns it there also. The greatest care should therefore be taken to exclude the possible existence of an arterio-venous aneurism, when it is proposed to perform the Hunterian operation in any case of aneurism of the extremities. The explanation for the frequent occurrence of gangrene in these cases given by Stromeyer (*Handbuch der Chirurgie*, 1844) is undoubtedly the correct one, namely, that when the collateral circulation is established and the blood finds its way past the ligature into the artery beyond, it flows directly into the vein through the communication with that vessel, instead of passing on to the peripheral circulation. Therefore, an accidental inclusion of the vein with the artery in the ligature would actually be a favorable occurrence.

Double ligature of the artery.—The double ligature of the artery above and below the point of communication, treating the latter as a simple wound of the vessel, and without attacking the sac itself, has given fairly good results. Of 15 cases we find 9 cured, 2 relapsed, 1 recovered after amputation for gangrene, and 3 died. Of the deaths all were in pre-antiseptic times, 1 was due to gangrene, 1 to secondary hemorrhage, and 1 to amputation on account of secondary hemorrhage. We shall return to the question of gangrene later. Two cases relapsed—Norris's, situated upon the brachial, and Davies-Colley's, upon the femoral in Scarpa's triangle. In the first case the relapse was due to an arterial branch given off from the sac, which fed it after the ligature was applied; and in the second it is supposed to have been due to the premature softening of the catgut ligature. The cause in Norris's case illustrates the strongest objection to the method, and among the cases of this disease examined by operation or post-mortem will be found many which have the same anatomical arrangement, making a cure by this method an impossibility; for instance, those of Brainard, Ollier, Venturoli, v. Wahl, and myself. As bearing upon this point we may also quote the case of Galozzi (Bramann, Case 127), who tied the external iliac without improvement, and some days later tied the femoral in Scarpa's triangle below the sac, also without effect—the number of branches given off in this location readily explains the bad result. We may also note Stimson's case (American Journal of the Medical Sciences, 1884, lxxxvii. 325, and *N. Y. Med. Journ.*, 1888, i. 214, 555) of aneurismal varix between the common carotid near its bifurcation with the internal jugular vein, in which he tied the common carotid with temporary improvement, and four years later secured both the external and internal carotids beyond the point of communication between the artery and the vein without lasting result, the intermediate

part of the artery evidently being fed by the superior thyroid, as pressure in the course of that vessel caused the thrill to cease.[1]

Ligature of both vessels.—A greater security against relapse from this cause is obtained by ligature of both the artery and the vein close to the sac. It is not absolutely necessary to ligate the vessels peripherally, for central ligature of both vessels has produced a cure in two cases (Moore, Keen[2]), although this practice is certainly not sufficiently reliable to be recommended for general adoption. In three cases the artery was ligated above and below, and the vein peripherally only, or centrally only, all being successful—unless we except Davies-Colley's (the second operation in this case), in which it was supposed that the catgut ligature softened prematurely, causing a partial relapse which necessitated a third operation in which the artery was ligated again below. In two cases both vessels were secured above and below. We have then 7 cases of ligature of both vessels, 6 cured, and 1 in which relapse took place from softening of the ligature on the artery. They include 3 at the flexure of the elbow, and 1 each of the temporal, femoral, popliteal, and tibial arteries.

We may note in passing that Monmonnier (Bramann, Case 93) cured an arterio-venous aneurism at the flexure of the elbow, of short duration, by obliterating the basilic vein above and below the point of communication, by passing pins beneath the vessel and making figure-of-eight turns of a ligature over them. Stromeyer claims to have cured a temporal arterio-venous aneurism by ligation of the vein alone beyond the point of communication, but he also ligated another vessel (which he thought to be a vein) which communicated with the varix and was accidentally wounded in the operation—moreover, the pulsation and thrill continued after the operation and the wound healed with long and tedious suppuration, so the cure may fairly be ascribed to the effect of this inflammation around the sac.

Incision and ligature—The so-called ancient method of treating aneurisms by incision and ligature of the vessels, with which we may also include the cases in which the vessels were ligated before the sac was laid open, is a more satisfactory method than simple ligature, and it is also generally easier of execution. The cases of incision of the sac with ligature of the vessels number 17. Among these there were 5 deaths and 1 recovery after amputation of the limb, but all of these accidents occurred in pre-antiseptic times, and they were all due to sepsis or secondary hemorrhage; the fatal cases being thus distributed—1 brachial, 3 femoral, and 1 popliteal, and the amputation having occurred in a pop-

[1] Dr. Stimson tells me that the man is still alive, the aneurism unaltered.

[2] Dr. Keen informs me that his patient was free from any return when he last saw her, about two years after the operation.

liteal case. Of the 11 cured, 2 were temporal, 6 brachial, 2 popliteal, and 1 tibial. It should be noted that all but 4 of these 17 cases were operated upon prior to 1870.

Extirpation.—An equally reliable method is that of extirpation of the aneurismal sac, of which I have the records of 20 cases. There is only one death in this series, which was due to sepsis, although it was operated upon by a capable surgeon in 1878, affording an illustration that accidents will sometimes occur in the course of wound-healing even in modern days. Relapses were impossible, consequently all of the remaining 19 cases have been cured. The cases are thus distributed: temporal 4, radial (fatal) 1, brachial 3, axillary 1, articular artery of the knee 1, anastomotica magna 1, femoral 6, and popliteal 3.

Results.—To gain a proper idea of these operations upon the sac, or upon the vessels near the point of communication, we must group them together, for the differences between them as to danger to life and limb may be considered about equal, since, although the extirpation of the sac may require more time than incision, this appears to have produced no effect upon the mortality, the only death in the 20 cases of extirpation having been due to sepsis, and not to the prolonged operation. Moreover, the accidental fact that most of the cases of extirpation were performed since 1870, while those of incision were performed before that date, gives the former almost no mortality, and the latter a death-rate of nearly 33 per cent. We have, then, a total of 60 cases treated by these various operations, with 47 cures, 2 relapses (both in operations upon the artery alone), 2 limbs lost by amputation, and 9 deaths. All but one of the cases in which life or limb was lost were operated upon before 1870, and in all but two sepsis was the cause of the accident. In these two gangrene occurred, and this brings us to a question which has been left until now for our study.

In 21 operations upon the brachial there was one case of gangrene, in 16 upon the femoral there was 1 case of gangrene, and also Billroth's fatal case of incision with ligature of both artery and vein, in which, on account of secondary hemorrhage, the artery had to be tied again above the origin of the profunda, and gangrene followed. On account of the known frequency of gangrene after ligature of the common femoral, we may regard this case as bearing only upon aneurisms so situated that a ligature of the common femoral would be necessary. The other case of gangrene from ligature of the femoral was Dupuytren's case of incision and ligature for a varicose aneurism in Hunter's canal, in which the arteries of the entire limb were degenerated, and in which the unnatural condition may have had something to do with the result. The case of gangrene after ligature of the brachial was a varicose aneurism of the flexure of the elbow operated upon by Roux with ligature of the artery alone above and below the sac, after continuous pressure and bandaging

had been kept up during the three years of its existence, and Roux very plausibly refers the gangrene to a diminution of the blood-supply of the limb, owing to this treatment. In addition to these 37 cases, there are 9 operations upon the popliteal, and 1 upon the axillary artery without gangrene—a total of 46 operations upon the main artery and vein of a limb with only 3 cases of gangrene, even including Billroth's, results which are so good that, bearing in mind the peculiar character of those 3 cases, we can safely say that in the ordinary arterio-venous aneurism (after a duration of one month) there is less danger of gangrene in securing both vessels near their point of communication than there is in applying the Hunterian ligature for true arterial aneurisms.

Conclusions.—We have seen that compression is only suitable for cases which are seen early, and in which the affected vessels lie superficially; and if it is not successful at once, or, if its employment is difficult or painful, the risks of operation are not sufficiently great to warrant delay. It is my conviction that all these cases should be treated by operation, with the single exception of the cases involving the internal jugular, or requiring ligature of the common femoral artery and vein. It does not appear necessary to distinguish between aneurismal varix and varicose aneurism as to treatment. The choice of methods depends upon the size and situation of the aneurism. In a general way, it may be said that all small aneurisms not involving the larger vessels of a limb should be extirpated unless important nerves are jeopardized by the dissection, or, as on the face, it is important not to leave a scar. The treatment selected for larger aneurisms depends upon their situation. Those of the neck which involve the external jugular vein will rarely require treatment, but should it be necessary, such cases are best treated by double ligation of both vessels. In other situations the simple ligature of the vessels should not be chosen, for it will, in most cases, require as much dissection as will incision or extirpation, while not giving the same immunity from relapse. The surgeon should make an incision down upon the sac in its entire length, and attempt to dissect it from its bed. If this prove difficult or impossible because of inflammatory thickening or intimate connection with important parts, the sac should be incised, for it is often easier to secure the vessels when the sac is freely opened. The sac could then be left entirely in place, or it could be partly removed, and it may be as well to say that suture and simple drainage of the sac have been found sufficient, and that it is unnecessary to resort to packing. In closing, we must not forget that the recently-introduced suture of veins, and the successful experimental suture of arteries, may alter our methods of treatment in some of these cases—in fact, Bassini (*Riforma med.*, 1890, April 15, 16) has already cured a case by double ligature of the artery and suture of the opening in the vein.

Literature of Cases.

To economize space I quote only the numbers of cases in Bramann's list which are correctly referred to by him, but I have verified his cases in the originals, except Cases 55 and 148, which were not accessible. I have included in my list only cases of four weeks' standing or more, for those of shorter duration are more correctly studied as wounds of artery and vein than as aneurisms.

Double Ligature of Artery.

Dupuytren: Breschet, Mém. Acad. roy. méd., Paris, 1833, iii. 226.
Norris: Amer. Journ. of Med. Sciences, 1843, v. 28. (First operation.)
Roux: Quarante Années de prat. chir., Paris, 1855, ii., Cases XXXVI. to XXXIX., pp. 286 to 295.
Malgaigne: Bull. Soc. anat., Paris, 1858, xxxiii. 355.
Hamilton: Holmes, Lancet, 1874, ii. 543.
Blomfield: Lancet, 1881, ii. 829.
Davies-Colley: Guy's Hospital Rep., 1888, xiv. 348. (First operation.)
Championnière: Bull. Soc. chir., 1888, Paris, xiv. 39.
Branham: Internat. Journ. of Surgery, New York, Nov., 1890, p. 250.
Bramann: Arch. f. klin. Chir., 1886, xxxiii. 1. Cases 55, 66, and 117.

Ligature of Both Vessels.

Moore: Med.-Chir. Trans., xli. 1; and Brit. Med. Journ., 1857, 972.
Keen: Med. News, Phila., 1887, ii. (vol. li.) 725.
Roux: Loc. cit., Case XXXV. p. 271.
Davies-Colley: Loc. cit. (Second and third operations.)
Bramann: Loc. cit., Cases 89, 148, and 155.

Incision.

Breschet: Loc. cit., p. 219.
Bérard: Compend. chir. prat., ii. 127; and Arch. gén. méd., 1845, sér. iv. T. vii. p. 38.
Norris: Loc. cit. (Second operation.)
Brainard: Illinois and Indiana Med. and Surg. Journ., 1848. N. S. ii. 505.
Roux: Loc. cit., Case XL. p. 299.
Richet: Bull. Soc. chir., Paris, 1862, 281; and Gaz. des hôp., 1861, p. 215.
Nélaton: France méd., 1863, 197.
Nélaton: Reclus, Bull. Soc. chir., Paris, 1863, 285.
Billroth: Chir. Klinik. Wien., 1868, 158.
Verneuil: Reclus, loc. cit., p. 280.
Bramann: Loc. cit., Cases 46, 109, 3, 74, 8, 149, 156.

Extirpation.

Ollier: Mém. Soc. méd. Lyon, 1865, iv. Part 2, 159; and Reclus, loc. cit.
Beach: Boston Med. and Surg. Journ., 1867, lxxvii. 361.
Thorndike: Boston Med. and Surg. Journ., 1878, xcix. 475.
Robinson: Brit. Med. Journ., 1887, ii. 885; and Path. Trans., London, 1888, xxxix. 85.
Trélat: Delbet, Bull. Soc. chir., Paris, 1889, xv. 153, 491.
Menocal: Rev. de Cien. Med., Habana, iv., 1889, 161.
Graziani: Riforma Med. Napoli, Jan. 7–10, 1890.
Simons: Trans. South Carolina Med. Assoc., Charleston, 1890, p. 125.
Weir: *Curtis*, this paper.
Bramann: Loc. cit., Cases 49, 2, 7, 154, 122, 137, 10, 139, and 159.

REVIEWS.

THE MICROÖRGANISMS OF THE HUMAN MOUTH. By WILLOUGHBY D. MILLER, D.D S., M.D. Pp. 364, with 130 illustrations, including Photomiorographic Plates. Philadelphia: The S. S. White Manfacturing Company, 1890.

THE publication of this remarkable record of experimentation and research cannot fail to meet with a most hearty welcome from practitioners of medicine, while the dental specialist will hail it as the most valuable of all recent contributions to dental science.

Previous to the publication of Professor Miller's investigations the presence of microörganisms in carious teeth was fully recognized, and that they might be found to be important factors in the decalcifying process often suspected; but the credit of fully demonstrating the correctness of what, previous to his investigations, was but mere conjecture, belongs entirely to Professor Miller. Objections have been made to his deductions on the ground that he has not entirely solved the problem of dental caries, that he throws but little additional light upon predisposing causes; but while Professor Miller has been able to demonstrate the fact that all microörganisms of the oral cavity which possess the power of exciting an acid fermentation of foods may, and do, take part in producing the first stage of caries, and also that all possessing a peptonizing or digestive action upon albuminous substances may take part in the second stage; and finally, that those possessing both properties at the same time may take part in the production of both stages, he has by no means ignored the predisposing causes of caries. In Chapter VIII., under the general heading of "Etiology of Dental Decay," the subject is very fully considered. In the pathology of the teeth it is not in every case easy to draw definitely the line between predisposing and exciting causes. This is clearly illustrated in the case of the third molars, the so-called wisdom teeth, which are generally believed to be predisposed to caries, even in mouths where the more anterior teeth are of good quality. In these third molars decalcification almost invariably appears on their buccal surfaces, as well as in the depressions of the crowns; but these teeth are, in consequence of their positions, beyond the sweep of the tooth-brush, and not usually brought into full service in mastication, hence they are nearly always covered with particles of amylaceous substances, which, remaining from day to day, undergo fermentation, and solution of the softened residue soon follows. Professor Miller very clearly shows that while the conditions which are usually considered as predisposing causes invite decay, they do not produce it, and that if the active agents are kept away decay cannot occur, no matter how inferior in quality the teeth are.

In "Microörganisms of the Human Mouth" Professor Miller very con-

cisely outlines the morphology and biology of bacteria. He describes the nutrient media for them as found in the oral cavity, their development, and the part they play as excitants of fermentation, together with the action of the products of fermentation on the different structures of the mouth.

Under the head of "Prophylaxis of Dental Decay" is found much valuable information relative to the use of antiseptics in the prophylactic treatment of decay, the antiseptic action of filling materials, and the sterilization of teeth for the purpose of implantation.

Valuable data, the result of a great number of experiments and much research, are given in Chapter X., under the head of "The Pathogenic Mouth Bacteria, and the Diseases which They Produce"; also in Chapter XI., "Entrance-portals of Pathogenic Mouth Bacteria," together with a record of a series of careful experiments in the study of Pyorrhœa alveolaris, the infections resulting from accumulations of the excitants of diphtheria, syphilis, typhus, etc., in the oral cavity.

The tables showing the relative efficacy of the different antiseptic agents, and the comparative acidifying power of different articles of food, add much to the value of the work as a text-book of dental histology. Indeed, it may truly be said that in that capacity it will for a long time remain without a rival.

The general make-up of the book is all that could be desired. The illustrations are distinct and accurate, and the publishers are entitled to much credit for the excellent manner in which their part in the production of the work has been performed.

Now that histology has become a requirement in some of the dental schools, Professor Miller's work must quickly become indispensable to students as a text-book, nor can the practitioner of dentistry afford to be without it, and the non-professional reader also might derive much advantage from its study. C. J. E.

DISEASES OF THE NOSE AND ITS ACCESSORY CAVITIES. By W. SPENCER WATSON, F.R.C.S. Eng., B.M. Lond., Surgeon to the Throat Department of the Great Northern Central Hospital; Senior Surgeon to the Royal South London Ophthalmic Hospital; formerly Assistant-Surgeon to King's College Hospital; Fellow of the Royal Medical and Chirurgical Society; Member of the Ophthalmological Society of Great Britain and Ireland; Member of the West London Medical and Chirurgical Society, etc. WITH SPECIAL SECTIONS ON DISEASES OF THE SKIN OF THE NOSE, ON INJURIES, ON RHINOPLASTIC OPERATIONS, AND ON EAR AFFECTIONS IN THEIR RELATION TO INTRA-NASAL DISEASES. By DR. ROBERT LIVEING, MR. WILLIAM ADAMS, and MR. A. E. CUMBERBATCH. Second edition, with numerous engravings and lithographic plates. 8vo., pp. 318. London: H. K. Lewis, 1890.

IF our recollection of the first edition of this work serves us correctly, that volume, for its date, was a far more valuable exponent of its subject than the present one seems to be. Some portions are much more thorough, practical, and representative of progress than others. This in-

equality is probably due to exigencies of practice favoring the author's experience in certain lines, in the discussion of which he is perspicuous and accurate, while he is discursive and uncertain in the discussion of certain other lines with which he is apparently less familiar. Hence many allusions are made to practices known to the author only from his extensive acquaintance with the writings of others. American authors receive a great deal of deference, especially Rumbold, Bosworth, and Sajous. To the practitioner who fairly knows his subject the book will be of far greater service than to the novice. Due allowance can be made where the general advance in pathology and therapy has not been maintained, and due appreciation be accorded where its authority is most excellent. Few unusual affections will be encountered in practice concerning which some valuable instruction or information as may be, will not be found in these pages. The text takes in a wide range of subject-matter; external nose, interior of the nose, and the adjacent and intercommunicating cavities, passages, and structures, and almost every morbid condition which ever occurs in these regions receives some consideration. The descriptions of healthy and diseased structures are good and often elaborate. The constitutional origin of disease is duly expressed. The risks of delay and of temerity are recounted; the advice as to management is sound; the surgical treatment adopted is judicious and conservative. Haphazard and hazardous procedures receive no endorsement. The illustrations of diseased conditions and of many appliances for their treatment and correction are admirably portrayed, especially in connection with diseases of the maxillary sinus and with destructive diseases of the nose.

In describing the methods of illumination with minute electric lamps attention is directed to a risk of their cracking and breaking into fragments. Voltolini's lamps, however, are enclosed in thick glass capsules which, we fancy, would maintain their integrity even though the lamp underwent fracture. We fully endorse a recommendation of the Welsbach burner as a source of illumination.

An original method of controlling the palate during rhinoscopic inspection, and one which the author finds superior to all other plans, is that of directing the patient to breathe rapidly in short gasps and to concentrate his attention on his chest movements to divert it from his throat. A plan to relax the palate which we have often employed, and which we have not seen anywhere described, is to get the patient to keep his structures in the position of a laugh during the examination.

In using cocaine preliminarily to evulsion of growths, the recommendation is given to apply with cotton wads freshly-made solutions in equal parts of glycerin and water, a combination which is stated to favor its penetration into the cavity.

For seizing polypi and other morbid growths to prevent their escape from the forceps or the snare, a two-pronged corkscrew-shaped tractor is recommended, which can be twisted into the growth, a device which seems to us most excellent in conception. A ring-shaped knife is recommended for the removal of portions of turbinated bodies with the polypi upon them. A peculiar sliding forceps, one branch of which works within a slot in the other somewhat like a clamp, devised by the author for use where the ordinary scissor-playing blades could not be entered, appears to us admirably adapted to the purpose.

Neuro-paralytic ulceration of the nasal mucous membrane is described, ulcers in connection with paresis of the fifth pair of nerves. This is a lesion which we do not remember to have been noted by other writers. The ulcers are said to progress steadily, though healing from time to time under generous diet and avoidance of exposure to cold. But one instance is mentioned, and in that one the patches of excoriation varied from the size of a split pea to that of an English sixpence. They were dry and sluggish, and increased in size from day to day, but almost imperceptibly.

These few points are illustrative of special practical features in the volume, which we are very glad to place beside its predecessor in the working portion of our library. J. S. C.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS; WITH ESPECIAL REFERENCE TO THE APPLICATION OF REMEDIAL MEASURES TO DISEASE AND THEIR EMPLOYMENT UPON A RATIONAL BASIS. By HOBART AMORY HARE, B.Sc., M.D., Clinical Professor of Diseases of Children and Demonstrator of Therapeutics in the University of Pennsylvania; Secretary of the Convention for the Revision of the United States Pharmacopœia of 1890. 8vo., pp. 622. Philadelphia: Lea Brothers & Co., 1890.

THERAPEUTIC handbooks multiply. Materia medica proper is in the background, and, to a considerable extent, justly so. The writer once heard a medical orator of deserved eminence (a surgeon) say in his address that the study of therapeutics should begin with medical botany, and then proceed upward through chemistry to its useful end. Most medical teachers, knowing the demands made upon the student for knowledge of diagnosis, and the great number of specialties in which a well-fitted man must attain a certain measure of proficiency, would say, with the writer, that although medical botany may be an elegant accomplishment for the practitioner, it is by no means a necessity, and to devote a large amount of time to it in an ordinary three years' course would be folly.

As a matter of fact, it is probably a very small proportion of students who have any real knowledge of botany of any kind, either when they enter or when they leave the medical schools of this country. Another view, and a much more plausible one, is that the student should be familiar with a large amount of experimental pharmacology; should, perhaps, have experimented himself, and upon this knowledge base his practical therapeutics.

I think most teachers of therapeutics would recognize the fact that a large amount of the experimental information gained within the last twenty or thirty years is of a kind which, if not useless for the study of practical therapeutics, is not capable of being utilized by the average student for that purpose, nor, indeed by any student, without very special and laborious study under skilled guidance.

The purely empirical school need not be dwelt upon. As a distinct school it is little in favor at present, but authors and teachers recognize the necessity of bringing to bear upon the study of the action of drugs,

and especially their remedial action, all the resources at our command, and of harmonizing not only the experimental data furnished by different observers, but the facts acquired by careful clinical observation.

It is from this point of view that all the recent text-books have been written, and the one before us is another claimant for favor in this class.

The author possesses special qualification for this task in the work he has done in experimental pharmacology; but he has, notwithstanding this temptation, avoided the error of basing his statements exclusively thereon, and endeavored to show the bearing and connection of the two sets of facts, and their application to actual practice.

The work is divided into four parts for convenience of reference.

After a concise introductory section the second takes up the drugs of the *United States Pharmacopœia* and others in general use, in the alphabetical order, giving first a very brief description of the drug itself, and then stating its mode of action and its application in disease, as well as the methods of administration. In the case of the more powerful drugs, the symptoms of poisoning and its treatment are given.

The third part treats of remedial measures other than drugs.

The fourth part consists of sections upon the treatment of diseases and symptoms, arranged in the same way.

It is out of the question to criticise minutely a work composed of so many short articles of varying importance.

In the present state of materia medica, with its enormous numbers of drugs containing the same or closely-allied principles, and the extreme rapidity with which new compounds are being added by the chemist, it appears to the writer that one of the wants is generalization. This, however, it would be unfair to find fault with this book for not attempting, as it is hardly compatible with its plan and arrangement.

It appears, also, to the writer, to be a mistake to try to present, in the compass here admitted, a systematic plan of treatment for each one of the whole alphabetical catalogue of diseases. There is either too much or too little. However, the attempt having been made in this instance, it is fair to say that it is by no means altogether unsuccessful. The treatment suggested is judicious and practical.

There are, as is likely to happen in nearly all first editions—and it is fortunate if they are not continued—a few slips.

We may suggest that a person who tries the author's first plan of disinfection (p. 319), by heating sulphur in an *iron* pan over an alcohol lamp, is very likely to find himself involuntarily trying the second, where the sulphur is mixed with the alcohol.

Again, it is not easy to understand how the water which has been used to scrub the floor of an infected room can be afterward boiled.

In a future edition the slight air of hurry and sketchiness which seems to attach to the present one can easily be removed. E.

THE CROONIAN LECTURES ON CEREBRAL LOCALIZATION. BY DAVID FERRIER, M.D., etc. London, 1890.

THE world of scientific medicine will welcome, in book-form, the latest authoritative statement of cerebral localization by the foremost

pioneer in this department of physiological research. This book is a reprint of Dr. Ferrier's lectures before the Royal College of Physicians. It is safe to say that it brings the subject entirely up to date. It is founded upon both experiment and clinical observations of the author and others. It is, of course, a statement of Dr. Ferrier's particular views, and is sometimes controversial, but the great amount of experimental work done by the author, and his accurate observation, go far to justify his conclusions, which his clear language so admirably sets before the reader.

Much of this book is necessarily a restatement of facts now generally accepted: this is true especially of the part devoted to the motor centres. In the remaining part a few points are especially noteworthy.

The author does not recede from his original position that the angular gyrus is the cortical centre for vision, although he enlarges the limits of the centre to include portions of the occipital lobe. Thus he speaks of the "occipito-angular region" as the visual area of the cortex. Complete destruction of this area in one hemisphere, he says, causes permanent hemianopsia to the opposite side by paralysis of the corresponding halves of both retinæ, while bilateral destruction causes complete and enduring blindness of both eyes. Again, he says, the angular gyri are more particularly the centres for clear vision, each mainly for the eye of the opposite side. Hemianopsia accompanying cortical lesions of the occipital lobe proper, he thinks, is due probably to direct or indirect implication of the optic radiations. The opinion of Seguin and Nothnagel that the cuneus, or the apex of the occipital lobe, has a special relation to visual perception is not supported, Dr. Ferrier thinks, by experimental research. The apparent relation between lesions of the cuneus and hemianopsia is due to the special proclivity of this region to affection by morbid vascular conditions, and to coincident implications of the optic radiations of the occipito-temporal region. All these statements are clear and unequivocal, and the whole subject is elaborated at great length. As it is of great clinical importance it is much to be desired that experimenters should agree upon such a vital question. To be told that the cuneus has no connection with vision will disturb the acquired knowledge of many clinicians.

Dr. Ferrier gives the details of recent experiments to determine the auditory centre. His description of the actions of a dog-faced monkey in which he had excised the superior temporal gyrus on both sides is very graphic and conclusive as to the localization of hearing in this convolution. The facts of human pathology, the author thinks, undoubtedly support the view that the sense of hearing is localized in the temporal lobe, and more especially in the superior gyrus. Space does not permit an examination here of the claims to a localization of the tactile centre and of the centres for taste and smell.

The author gives due credit to the experiments of Horsley and Schäfer which demonstrate that the marginal convolution (the mesial aspect of the brain) presides over the trunk and hip muscles. It is noted, however, that to paralyze these muscles completely, which are bilaterally coördinated in this convolution, it is necessary to extirpate the centres of both hemispheres. This fact may be of some practical importance to the surgeon. For instance, the advisability of a cortical operation for obstinate torticollis was discussed recently in the Philadelphia Neurological Society. The question presents itself whether or not the muscles in-

volved in torticollis are bilaterally coördinated—*i. e.*, whether it would be necessary to remove the centre in both hemispheres? Dr. Ferrier's experiments do not appear to show this bilateral innervation. On the other hand, however, he says that there is reason for believing that the lateral movements of the head (and eyes) are not capable of being permanently paralyzed unless every portion of the frontal region be completely destroyed—a very heroic operation on man.

Dr. Ferrier is very positive that no form of sensation is localized in the motor cortex, and marshals a great array of facts, especially from recent autopsies and surgical cases, to support his position.

In conclusion, we are tempted to ask, Is the brain, after all, nothing but a sensori-motor ganglion? Are the rudiments of every idea a *sensation* and a *reflection;* has every psychic act a sensory and a motor aspect? This was practically the position of Locke, the greatest, most scientific English psychologist. Is he to be verified, even if only in part, by the experiments of the modern brain physiologists?

J. H. L.

STERILITY IN WOMEN, INCLUDING ITS CAUSATION AND TREATMENT. By ARTHUR W. EDIS, M.D. Lond., F.R.C.P., Senior Physician to the Chelsea Hospital for Women; Late Obstetric Physician to the Middlesex Hospital, etc. Pp. 112. With thirty-three illustrations. London: H. K. Lewis, 1890.

As the author states in the preface, this monograph is simply a chapter from his former work on diseases of women, with some changes and additions, the latter being principally in the form of clinical histories. We confess that it is not easy to discover the *raison d'être* of the book, since the writer had nothing new to say and has not in publishing it added to his deserved reputation. The student does not need another monograph on this subject; the general practitioner will find it amply covered by Reeves Jackson's article in the *American System of Gynecology;* while for the specialist it is as elementary as it is antique. So much careful work has been done in this direction since the appearance of Sims's classic, that we are surprised to find that the writer has either overlooked or is not familiar with the recent French and German *brochures.*

In the introductory paragraphs attention is called to the possibility of sterility in the male. Too little stress is laid upon this point. The student should be taught that neither can the real cause of an unfruitful marriage be ascertained, nor can any truthful prognosis be given as to the results of local treatment until it is positively determined that the husband is not the guilty party. Injustice is constantly done to innocent women. Who will shield them from undeserved reproach, if not their physicians, who alone are in a position to learn the truth? Among the causes of sterility we notice that prevention of conception during the early years of marriage has not been mentioned. The family physician is a potent agent in the "prophylaxis" of sterility (if we may so term it) if he will only lay aside his mistaken notions of propriety and handle this delicate subject without gloves. Many women have

occasion to repent bitterly their successful efforts to prevent conception soon after marriage, resorted to in ignorance of their harmfulness. Altogether too much stress has been laid upon anteflexion as a cause of sterility; we are too apt to grasp at this in the absence of definite knowledge. Who can pretend to say just what degree of contraction of the canal is sufficient to prevent the ingress of spermatozoa?

The operation of divulsion for stenosis of the os internum is touched upon briefly in comparison with the attention given to incision. "In contrasting the results obtained by division of the cervix with dilatation by tents," we read, "the former method seems to be attended by less [?] risks." We marvel at finding that posterior section is still taught as a safe method of treating cervical anteflexion, an operation which has been almost entirely abandoned in this country. Surely some attention should be called to the fact, so clearly demonstrated by Wylie, that it is the complicating endometritis which should receive treatment as much as, or more than, the original flexion.

Confusion is introduced by discussing retroversion and retroflexion under separate sections. How often do we meet with a pure retroversion, considered from a strictly anatomical standpoint? The treatment of fixation of the retro-displaced uterus, the most common and important of these conditions, is passed over in silence.

The closing section bears the obsolete title, "Granular Degeneration of the Cervix Uteri." When we add that the author suggests no new line of treatment, but only the old-fashioned local applications—caustics, etc.—we have given the reader a sufficient idea of its scope.

With all due respect to his high reputation, we can only repeat what we said at the outset, that a man who has written an excellent work on gynecology, eight or ten years ago, does not follow the wisest course in publishing a separate chapter from the same in the form of a monograph, especially if the latter shows decided evidences of the fact that he has failed to recognize the enormous strides which have been made in this department of medicine during the past decade. The medical public at the present day has a right to expect in a monograph either originality or judicious and exhaustive compilation, both of which elements are wanting in the present volume. H. C. C.

A DICTIONARY OF PRACTICAL MEDICINE. Edited by J. K. FOWLER, A.M., M.D. London, 1890.

THE editor of this dictionary, and the contributors thereto, are to be congratulated upon having been able to present, in these days of many-volumed treatises on medicine, so much real information concerning the subjects belonging to practical medicine within the moderate compass of a single octavo volume of less than a thousand pages. The dictionary contains upward of six hundred articles, most of them brief, but many of those upon the more important subjects fairly complete.

Among the more noteworthy articles may be mentioned: "The Diagnosis of Abdominal Tumors," "Acromegaly," "Albuminuria," "Bright's

Disease," "Fever," "Microörganisms," "Localization of the Lesions of Phthisis," and the numerous contributions upon diseases of the skin.

In discussing the prognosis of the various forms of albuminuria, Maguire expresses the opinion that "albuminuria, even when undoubtedly of functional origin, should always be considered as a diseased condition," and regards it as predisposing to attacks of acute Bright's disease. For the detection of albumin in the urine, preference is expressed for the magnesium nitric test of Sir William Roberts, because of its greater delicacy. We cannot agree with this author (Maguire) in the statement that cold is the most frequent cause of acute Bright's disease. On the contrary, we believe that the number of cases which arise from exposure must be small in comparison with those occurring as a sequel or complication of the specific fevers.

Fever (pyrexia) is defined by MacAlister as "a certain disorder of the body-heat, *usually* characterized by a rise of temperature." Can there be fever without a rise of temperature?

Mr. Victor Horsley, who contributes an article upon "Hydrophobia," accepts unreservedly the efficacy of the anti-rabic inoculations of Pasteur. While it is greatly to be desired that future investigations shall confirm the claims of those who advocate these inoculations, we do not think the question of their value is to be regarded as yet definitely decided.

We notice with pleasure a brief, but satisfactory, account of psorospermia, by Sutton. As yet, but little or nothing is to be found in the various text-books upon medicine concerning this subject, which is one of growing importance. Within the past few years, several cases of psorospermosis in man have been reported; and recent observations have suggested the probability that certain epithelial proliferations, as molluscum contagiosum, are due to psorospermial infection. Indeed, some recent French writers claim that Paget's disease is a cutaneous psorospermosis.

In the treatment of peritonitis, Williams adheres to the use of opium, no mention being made of the use of saline laxatives, which have recently been so much vaunted by some writers.

The editor contributes an article on the "Localization of the Lesions of Phthisis," in which he discusses the subject at some length. He endeavors to show that "the disease in its onward progress through the lungs, in the majority of cases, follows a distinct route, from which it is only turned aside by the introduction of some disturbing element," and he would make this fact of much importance in diagnosis and prognosis.

The various articles on diseases of the skin, which are written by Pringle, are exceedingly well done and contain much valuable information concisely and clearly presented.

Other articles of excellent quality might be mentioned, but want of space forbids their consideration.

In a few instances, it has seemed to us, an undue amount of space has been given to the discussion of unimportant subjects. As an example, an entire page is devoted to "Yawning," which, while interesting, perhaps, from a purely scientific point of view, can scarcely be regarded as of much practical importance. On the other hand, the subject of "Dyspnœa" is dismissed with less than a dozen lines.

Not the least valuable feature of this book is the thoroughness with which the various authors, as a rule, have incorporated in their contributions the most recent discoveries in the various departments of medi-

cine. Upon the whole, the dictionary may be said to be thoroughly up to date, and may be recommended to those who wish concise information upon the newest additions to medical knowledge. M. B. H.

STRICTURE OF THE RECTUM: A STUDY OF NINETY-SIX CASES. By CHARLES B. KELSEY, M.D. New York, 1890.

THE pamphlet before us contains the results of the author's experience in the treatment of stricture of the rectum. It is essentially a practical treatise, and is useful for this reason. After discussing the classification, symptoms, and diagnosis of stricture of the rectum, the author proceeds to a consideration of the methods of treatment. Dilatation, either alone or in connection with incision, is recommended as one of the most reliable agents in the treatment of this disease. The author very properly condemns the use of violence in practising dilatation; a bougie which is large enough to cause pain by stretching is always too large to do anything but harm. He advises the use of the soft-rubber bougie; a size being selected which will pass through the stricture without force and which may be left in place for several hours without causing uneasiness.

The treatment by incision, or external posterior linear proctotomy, is advocated in cases which cannot be cured by simple dilatation, and which are not caused by malignant disease. Out of the seventeen cases of proctotomy tabulated there were two deaths—both of which were cases of malignant stricture. We agree with the author's statement that neither theoretically nor from practical experience can the operation of proctotomy be recommended in malignant disease.

The treatment of electrolysis is dismissed with a few words. Electrolysis reduced to fact means, in the treatment of stricture of the rectum, either simple dilatation or the application of the cautery. The olive-pointed electrodes, placed against a stricture and gently pressed inward for ten or fifteen minutes, will cause exactly the same amount of dilatation and absorption whether the elaborate battery be connected with them or not.

The operation of excision is discussed and the technique of the operation is described. The operation should be performed as quickly as possible, bleeding being disregarded or controlled by sponge pressure until the whole diseased mass has been removed. The secret of success in extirpation of the rectum is to remove the disease as speedily as possible, and to control the bleeding by pressure during the operation and afterward until ligatures can be applied. The author states that in all his experience he has never seen a case of hæmorrhage which could not be controlled by direct pressure. There is a superstitious fear of hæmorrhage in the minds of men who have had but little experience in rectal surgery.

Colotomy is urged in suitable cases; the inguinal being preferred to the lumbar operation. As regards ease and certainty of performance, the subsequent cleanliness of the patient, and the ability to care for the opening, all the advantages are in favor of the inguinal operation. The dangers of the two operations are about the same.

In describing the operation of inguinal colotomy the author makes two valuable suggestions. Before the selected portion of colon is attached to the parietes, it is drawn downward till it is held firmly by the mesentery above, and is then fastened to the edges of the wound in this position. This proceeding prevents prolapse of the mucous membrane from the upper segment, a sequel which has never followed in any of the author's cases.

The second suggestion is to use a harelip pin as the first step in fastening the gut to the abdominal wound. The pin is passed through the parietes and through the mesentery of the gut, thus firmly securing it so that it cannot be displaced should straining occur under the anæsthetic or after. Again, it insures the formation of a sharp spur in the posterior wall of the gut.

The pamphlet concludes with a table of operations: proctotomy, colotomy, and excision. C. B. P.

ON THE TREATMENT OF DISEASES OF THE NERVOUS SYSTEM. By C. W. SUCKLING, M.D. (Lond.), M.R.C.P.; Professor of Materia Medica and Therapeutics at the Queen's Hospital; Extra Acting Physician to the Children's Hospital; Physician to the Workhouse Infirmary; and Consulting Physician to the Orthopædic and Spinal Hospital, Birmingham. 8vo., pp. 278. London: H. K. Lewis, 1890.

As the preface indicates, this little volume was prepared to serve as a complement to the author's earlier work on the *Diagnosis of Diseases of the Brain, Spinal Cord, and Nerves.* Dr. Suckling states his aim has been to render it a short and practical handbook of treatment. We think he has succeeded admirably. The diseases are arranged alphabetically; a concise definition precedes the outlined treatment in each instance where the name of the malady does not clearly define itself, and in many of the sections points of much value in diagnosis are interspersed. Indeed, in some of them semeiology is quite elaborately considered; that, for instance, on "Syphilis of the Nervous System" contains no less than seven pages devoted to the discussion of diagnosis, forming an excellent guide to the recognition of its various phases. When the size of the book, and the large number of subjects handled, are considered, it is surprising how completely yet concisely most of them are disposed of. In few instances does anything of importance seem omitted. Thus, though the chapter on "Convulsions" occupies less than three pages, it would be difficult to find anywhere in such brief compass so much valuable data as to diagnosis and treatment. It is of interest to note that the author here does not neglect to mention lead as a cause of eclampsia, and advises an inspection of the gums in cases of convulsions the origin of which is obscure—a point not often found in large treatises on diseases of the nervous system.

Amyl nitrite by inhalation is justly regarded as a valuable remedy in the paroxysm of angina pectoris where the blood-pressure is raised, but a much larger quantity may be required to influence the increased tension than the limit named—five minims. Ten, or even fifteen, minims rapidly inhaled will often succeed in aborting the paroxysm of

angina or of epilepsy, when a less quantity will be inoperative. Here, too, nitro-glycerin in the small dose advised will be found of trifling service unless administered *for effect* in increasing quantities. The dose of the latter is indicated as one minim of the one per cent. solution, and, in the posological table appended to the book, from one-half to two minims, no intimation being made of the necessity of the amount prescribed being regulated by the effect produced. As a rule, unless certain characteristic subjective symptoms follow its ingestion, the quantity administered is too small to be efficient. Tolerance is usually acquired so rapidly that the dose has to be steadily increased for its influence to be maintained.

We think the author shows singular freedom from insular prejudice in considering exophthalmic goitre under *B*, thereby placing Basedow's name before Graves's, and omitting the latter's altogether in the heading on the second page containing the outline of treatment of this disease. This, though probably an oversight, we cannot but regard as a trifle unjust to the memory of Graves, who, as is well known, fully described exophthalmic goitre five years before Basedow. The system of cognominal nomenclature of disease is not to be encouraged, but it is certainly desirable that where it cannot be avoided, credit be placed where it is due.

In the treatment of chronic hydrocephalus, following Gowers, the author advises that not more than an ounce of fluid be removed at a time. Unlike Gowers, however, Suckling believes that there is not much danger attending the operation. We entirely concur with him regarding freedom from risk, even when a much larger quantity is withdrawn. The smaller amount is, perhaps, all that should be removed in the first aspiration, or in subsequent ones, in cases where, the sutures having united, proper compression of the head, during and subsequent to tapping, cannot be applied. Practical experience and acquaintance with the literature of the subject permit us to assert that in suitable cases many ounces may be withdrawn entirely without risk, and with decided temporary benefit.

Suckling places a high value on chloralamide in insomnia, believing it to be the safest and most reliable of the hypnotics recently introduced. He considers sulphonal very uncertain in its effects, and regards paraldehyde as safe, but also uncertain. There is no doubt that sulphonal, as ordinarily prescribed, is uncertain, and that, however administered, it may cause disagreeable after-effects; but the same cannot be said of paraldehyde, which, in spite of its unpleasant odor and taste, still holds first place as a prompt and trustworthy sleep-producer.

It is stated that ophthalmoplegia interna is caused by syphilis, locomotor ataxia, diphtheria, and multiple sclerosis. It might have been well to add that many intra-ocular conditions may also originate it, such as glaucoma and various intra-ocular inflammations. It is one of the initial symptoms of sympathetic ophthalmia.

Regarding suspension in locomotor ataxia, the author holds the opinion now generally accepted by those who have given it a fair trial, that although it has in no case effected a cure, and often fails in affording relief, it may still be regarded as a most useful supplement to our armamentarium in the treatment of this disease. D. D. S.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,
ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

Koch's Treatment of Tuberculosis.

The researches of Professor Koch will prove to be of such great importance that an outline of what has thus far been published may well be considered at this time. Since the announcement, at the International Medical Congress last summer, that he had found a remedy which conferred upon the animals experimented on an immunity against inoculation with the bacillus of tuberculosis, and which arrested tuberculous disease, Professor Koch gave out in November a most important communication, which was published in many medical journals and in the newspapers.

The composition of the proposed remedy has just been disclosed—a glycerin extract of the tubercle bacilli. The brownish, transparent liquid which is used does not require special care to prevent its decomposition. When it is used it must be dilued, and these diluted solutions should not be kept, as bacterial growths soon develop inthem, and they are then unfit for use.

Introduced into the stomach the remedy has no effect; it must be used subcutaneously, and every precaution must be taken to keep the syringe used perfectly clean. The most suitable site for the injection is the skin of the back between the shoulder-blades and the lumbar region. Here the injection leads to the least local reaction, and is almost painless.

The action of the remedy on man and on guinea-pigs is widely different Calculated by body-weight, one-fifteenth-thousandth part of the quantity which has no appreciable effect on the guinea-pig acts powerfully on the human being.

After injecting four minims into his own upper arm, Professor Koch had pain in the limbs, fatigue, inclination to cough, difficulty of breathing, three or four hours after the injection. These symptoms rapidly increased during the fifth hour, and were unusually violent. A chill followed, which lasted almost an hour, at the same time there were nausea, vomiting, and a rise of

temperature to 103°. After twelve hours all of these symptoms abated; the temperature fell, and on the next day it was normal. A feeling of fatigue and pain in the limbs continued for a few days, and for the same period the site of the injection remained slightly painful and red. The smallest quantity of the remedy which will affect the healthy human being is about 0.14 minim (0.01 c. c.), or 1 c. c. of the one-hundredth dilution. This amount in most people causes slight pains in the limbs and transient fatigue. A few showed a rise of temperature to about 100.4°. The same holds good with regard to patients suffering from diseases other than tuberculosis; but the case is very different when the disease is tuberculosis, when such a dose, injected subcutaneously, causes a severe general reaction as well as a local one. The general reaction consists in an attack of fever, which usually begins with rigors, and raises the temperature above 102.2°, often to 104° and even 105.8°, accompanied by pain in the limbs, coughing, great fatigue, and often sickness and vomiting. In several cases a slight icteroid discoloration was observed, and occasionally an eruption like measles on the chest and neck. The attack usually begins four or five hours after the injection, and lasts from twelve to fifteen hours. Occasionally it begins later, and then runs its course with less intensity. The patients are very little affected by the attack, and as soon as it is over feel comparatively well.

The local reaction is best observed in cases in which the tuberculous affection is visible; for instance, in cases of lupus, changes take place which show the specific anti-tuberculous action of the remedy to a most surprising degree. A few hours after an injection into the skin of the back—that is, in a spot far removed from the diseased area on the face or elsewhere—the lupus begins to swell and to redden, and this it does generally before the initial rigor. During the fever the swelling and redness increase, and may finally reach a high degree, so that the lupus-tissue becomes brownish and necrotic in places where the growth was sharply defined. One sometimes found a much swollen and brownish spot surrounded by a whitish edge almost one centimetre wide, which again was surrounded by a broad band of bright red. After the subsidence of the fever the swelling of the lupus-tissue gradually decreases and disappears in about two or three days. The lupus-spots themselves are then covered by a soft deposit, which filters outward and dries in the air. The growth then changes to a crust, which falls off after two or three weeks, and which—sometimes after only one injection—leaves a clean, red cicatrix behind. Generally, however, several injections are required for the complete removal of the lupus-tissue. The changes described are exactly confined to the parts of the skin affected with lupus. Even the smallest nodules and those most deeply hidden in the lupus-tissue go through the process and become visible in consequence of the swelling and change in color, whilst the tissue itself in which the lupus-changes have entirely ceased remains unchanged. The observation of a case of lupus treated by the remedy is so instructive, and is necessarily so convincing, that those who wish to make a trial of the remedy should begin with a case of lupus.

The reaction of the internal organs, especially of the lungs, is not at once apparent, unless the increased cough and expectoration of consumptive patients, after the first injections, be considered as pointing to a local reaction in these cases; the general reaction is dominant, but we are justified in assum-

ing that changes similar to those seen in lupus also take place. The remedy will form an indispensable aid to the diagnosis of tuberculous processes, and with its aid we shall be able to make a diagnosis in doubtful cases of phthisis where it is impossible to obtain certainty as to the nature of the disease by the discovery of bacilli or elastic fibres in the sputum, or by physical examination. Affections of the glands, latent tuberculosis of the bone, doubtful cases of tuberculosis of the skin, and similar cases, will be recognized. In cases of tuberculosis of the lungs or joints which have been apparently cured, we shall be able to make sure whether the disease has really finished its course, and whether there be still some diseased spots from which it might again arise as a flame from a spark hidden by ashes.

In lupus its action seems to be curative, but in what way it occurs cannot as yet be stated with certainty, as the necessary histological investigations are not complete. It is, however, certain that it does not destroy the tubercle bacilli in the tissues, but only that the tissue inclosing the tubercle bacilli is affected by the remedy. It can influence living tuberculous tissue only, and has no effect on dead tissue, as, for instance, necrotic cheesy masses, necrotic bones, etc., nor has it any effect on tissues made necrotic by the remedy itself. In such masses of dead tissue living tubercle bacilli may possibly still be present, and are either thrown off with the necrosed tissue, or may possibly enter the neighboring and still living tissue under certain circumstances in the therapeutic activity. If the remedy is to be rendered as fruitful as possible, the peculiarity in its mode of action must be carefully observed. At first the living tuberculous tissue must be caused to undergo necrosis, and then everything must be done to remove the dead tissue as soon as possible, as, for instance, by surgical interference. Where this is not possible, and where the organism is unassisted in throwing off the tissue slowly, the endangered living tissue must be protected from fresh incursions of the parasites by continuous application of the remedy.

The fact that the remedy makes tuberculous tissue necrotic and acts only on the living tissue, helps to explain another peculiar characteristic, namely, that it can be given in rapidly-increasing doses, in the course of three weeks to five hundred times the original amount. It is probable that in the beginning of the treatment there is a good deal of tuberculous living tissue, and that consequently a small amount of the active principle suffices to cause a strong reaction, but by each injection a certain amount of the tissue capable of reacting disappears, and then larger doses are necessary to produce the same amount of reaction as before. So soon as the point is reached at which reaction is as feeble as that of a non-tuberculous patient, then it may be assumed that all tuberculous tissue is destroyed. Then the treatment will only have to be continued by slowly-increasing doses and with interruptions, in order that the patient may be protected from fresh infections while bacilli are still present in the system; whether this conception and the inference drawn from it be correct the future must show.

In nearly every case of lupus the treatment was as follows: The full dose of 0.01 c. c. was injected, the reaction was allowed to come to an end, and then after a week or two the same amount was injected, continuing in the same way until the reaction became weaker and weaker, and finally ceased.

In two cases of facial lupus the lupus-spots were thus brought to complete cicatrization by three or four injections, the other lupus cases improved in proportion to the duration of the treatment; all of these patients had been sufferers for many years, having been previously treated unsuccessfully by various therapeutic methods.

Glandular, bone, and joint tuberculosis were similarly treated by large doses at long intervals. The result was the same as in the lupus cases, namely, a speedy cure in recent and slight cases; slow improvement in severe cases.

With phthisical subjects, who made up the largest number of the patients, the conditions were somewhat different. Those with decided pulmonary tuberculosis are much more sensitive to the remedy than those with surgical tuberculous affections. For them it was found necessary to diminish the dose, as they almost all reacted strongly to 0.002 or even 0.001 cubic centimetre; from this small dose it was possible to rise more or less quickly to the amount that is well borne by other patients.

An injection of 0.001 c. c. was first given to the phthisical patient, and from this a rise of temperature followed; the same dose was repeated once a day until no reaction could be observed. This dose was then increased to 0.002 c. c. until this was borne without reaction, and so on, increasing by 0.001 or at most 0.002 to 0.005 c. c. This mild course seemed to be imperative in cases in which there was great debility. By this mode of treatment the patient can be brought to tolerate large doses of the remedy with scarcely a rise of temperature. But patients of greater strength were treated from the first partly with large doses and partly with frequently-repeated doses. Here it seemed that the beneficial results were more quickly obtained.

The action of the remedy in cases of phthisis generally showed itself as follows: Cough and expectoration were generally increased a little after the first injection, then grew less and less, and in the most favorable cases entirely disappeared. The expectoration lost its purulent character and became mucous. As a rule, the number of bacilli decreased only when the expectoration began to present a mucous appearance. They then entirely disappeared, but were again observed occasionally until expectoration completely ceased. Simultaneously the night-sweats ceased, the patient's appearance improved, and he increased in weight within from four to six weeks.

Patients under treatment for the first stage of phthisis were freed from every symptom of disease and might be pronounced cured; patients with cavities not yet too highly developed improved considerably and were almost cured, and only in those whose lungs contained many large cavities could no improvement be shown. Objectively, even in these cases the expectoration decreased and the subjective condition improved. These experiences lead one to suppose that phthisis, in the beginning, can be cured with certainty by this remedy. This statement requires limitation, in so far as at present no conclusive experiences can possibly be brought forward to prove whether the cure is lasting.

Relapses may occur, but it can be assumed that they may be cured as easily and quickly as the first attack; it is possible that patients once cured may retain their immunity. Patients with large cavities will probably

obtain lasting benefit only in exceptional cases. Possibly some of these severely-afflicted patients may be relieved by a combination of this new therapeutic method with surgical operation, such as the operation for empyæma. The treatment will probably be quite simple in cases in which the beginning of phthisis and simple surgical cases are concerned, but in all other forms of tuberculosis medical art must have full sway by careful individualization and making use of all other auxiliary methods to assist the action of the remedy.

In many cases the decided impression was created that the careful nursing bestowed on the patient had considerable influence on the result of the treatment, and Professor Koch is in favor of applying the remedy in proper sanataria, as opposed to treatment at home and in the out-patient room. How far the methods of treatment already recognized as curative, such as mountain climate, fresh air, special diet, etc., may be profitably combined with the new treatment cannot yet be definitely stated, but Professor Koch believes that these therapeutic methods will also be highly advantageous when combined with the new treatment.

The most important point to be observed in the new treatment is its early application. The proper subjects for treatment are patients in the initial stage of phthisis.

In the Charité Hospital in Berlin, Professor Fräntzel and Dr. Runkwitz have carried out Koch's treatment systematically, since September 13th, with Dr. Pfuhl's assistance. The new remedy was tried chiefly upon patients with phthisis, and, for purposes of comparison, upon patients whose lungs were healthy. Upon the healthy class small doses caused no reaction, but large ones were followed by a temperature of 102.2°, rigors, pains in the limbs, and exhaustion. In one case symptoms were caused which suggested the possibility of latent tuberculosis. The phthisical cases were of two classes, those in which the disease had made much progress, and those in which the progress was less marked. In four cases of the first class the progress of the disease was not stopped, in two of the cases no signs of healing were found after death. In eight cases, when the progress of the disease was less marked, the results were more satisfactory. One will suffice to suggest the general character of these cases.

A locksmith, twenty-one years old, of healthy family. In 1889, had swollen and discharging glands in the neck. Since May, expectoration and cough; from September 30th until October 3d, the expectoration was bloody. A tall man, of average development, with a flat thorax. Dulness in front on the right side to the second rib, behind dulness in the right supra-spinous fossa. Numerous râles over the right lung. The abundant bloody expectoration contained bacilli No. 6, counted according to Gaffky's method. Left lung free. After thirty-five days of treatment, the dulness on the right side was still to be recognized, râles few in number, but only found after coughing. No more blood expectorated; expectoration less and vitreous in character. No more night-sweats. Bacilli disappeared. Increase in weight one and a quarter pounds.

In the lighter forms of the disease the bacilli disappear for the time at least. The physical signs improve, the secretion is less, fever disappears, night-sweats cease, the cough is reduced to a minimum, the appetite is good, and

the body increases in weight. Obviously the method is one which will be of most service when applied early in the disease, and where there is not a large amount of material to be disposed of. For the conditions in the lung are not so simple as in lupus, for example, where the infiltrated tissue is readily thrown off. In the lungs the tuberculous tissue is killed, but it remains in the lungs, perhaps imbedded in cheesy material; in any case its expectoration is often very difficult. When these masses of tissue remain in the lungs they are a source of danger and a menace to the patient's life, for they contain bacteria which will renew their attack upon the system so soon as the treatment is stopped. This accounts for the fact that some patients who had ceased to react to the remedy, again reacted after an interval during which the treatment had been suspended. It will, therefore, be necessary to have patients under treatment for some time, and afterward at intervals test their immunity from a reaction to Koch's remedy.

In the out-patient department of the Charité Hospital in Berlin, Dr. Köhler and Dr. Westphal treated twelve cases of tuberculosis, including lupus and tuberculous affections of joints. The patients received injections of a one-per-cent. dilution of the remedy, beginning with a 1.6 ♏ (0.1 c. c.), which in some cases was gradually increased to 16 ♏ (1 c. c.). The syringe should be disinfected with absolute alcohol after each injection. The technique of the injection does not differ from that of giving an ordinary subcutaneous injection. As a rule, the injection is almost painless, and is accompanied by only slight local reaction. The usual general symptoms came on about six hours after the injection. From the time of the injection until the chill the patient had no discomfort, but with the chill there were headache, pains in the limbs and in the back, which disappeared as a rule on the next day. Some of the patients had with the chill considerable pain in the stomach and vomiting; with others these symptoms came on near evening, when the temperature was at its height, and disappeared with its subsidence.

While all tuberculous patients do not react in the same manner to the remedy, it is true that tuberculous patients are more susceptible to the action than non-tuberculous patients, the same dose being given in both cases. Most tuberculous patients have a chill after six hours, followed by fever, sometimes with a temperature up to 104°, which usually became normal within twenty-four hours. The pulse was increased during the fever up to 130–140 per minute. In some cases an exanthematous eruption, in others icterus, was observed.

The local appearances are most striking in lupus; in one patient who had lupus nasi a feeling of warmth, burning, and tension came on in two hours after the injection; three hours later the face was red; after five hours the parts affected had reached their maximum condition of swelling and redness. The swelling and redness were not limited to the diseased parts, but included neighboring parts. The affected parts, nose and upper lip, were also covered with an exudation in the form of yellow drops and crusts. Though the swelling and redness did not increase until the next day, the scabs were more numerous and thicker. The exudation did not appear to continue more than forty-eight hours. After two days the redness and swelling of the diseased spots and their vicinity began to diminish, and was limited, after five days,

to the affected places, and even these became much paler in the following three weeks.

Five days after the injection the scabs began to crumble, and on the ninth day could be removed easily. The nose was found to be no longer swollen, but smooth and pale-red over most of its surface, and was covered, as the other affected parts, with a delicate cicatrix. On the alæ nasi and their borders, as well as the nostrils, there were pale granulations, which were again covered with a scab within a few days, and they had fully cicatrized on the twenty-fourth day. On the fifteenth day there appeared on the smooth surface of the nose numerous soft red prominences about the size of a pin's head, often with a small blister, between them there remained the pale-red new cicatrix. The number of these small knobs and blisters increased to the day of the next injection. The injections were repeated after the twenty-seventh day three times, with intervals of two and one day. After each injection there appeared on that day swelling, redness, and exudation, but not with such intensity as after the first injection.

The total amount injected into this patient was a drachm of the one-per-cent. solution. In four cases patients who had old scars or wounds were chosen because they had no signs of tuberculosis, and to test the reaction of the remedy in such cases. No local changes in the wounds or scars were observed, but it was found that the remedy can cause general symptoms in non-tuberculous patients.—*Deutsche medicinische Wochenschrift*, November 4, December, 1890.

At the instance of Professor Gerhardt Dr. Hertel treated eighteen cases who had tuberculous affections of the larynx. The one-per-cent. solution, preserved with one-half per cent. of carbolic acid, was employed. At the site of the injection there was no special irritation.

In fourteen cases bacilli were found in the expectoration; in three others the tuberculous nature of the laryngeal disease was confirmed by the presence of lupus or physical signs in the lungs. In one the injection was made as a test.

The cases included four groups: First, those in whom, before the treatment, no signs of disease of the larynx were visible, but which became apparent after the injections. Second, patients who had what seemed to be disease of a tuberculous nature in the larynx, and which changed its appearance under the treatment. Third, such as suffered from undoubted tuberculous disease of the larynx; and fourth, two patients who had scarcely any general reaction from the remedy, and no local reaction in the larynx.

The experience of the few weeks' observation of these cases is as follows: The treatment renders the diseased spots more conspicuous. After a few milligrammes ($\frac{1}{67}$ grain) there appears, after a longer or shorter interval, a local reaction, sometimes accompanied by a general reaction, and sometimes without. The local reaction consists of a reddening and swelling of the diseased tissues, which changes its color in about twenty-four hours. Later a funnel-shaped ulcer forms in the middle of the diseased tissue. The diseased tissue shrinks, while there is greater or less discharge of mucus and liquid. Up to November 27th time enough for a cure had not elapsed, but the improvement has been continuous.

V. BERGMANN, by permission of Dr. Koch, presented patients, and described the treatment received by them in his clinic.

The cases treated are divided into four classes:

1. Thirteen cases of tuberculosis of the skin, including tuberculosis of the pharynx.
2. Four cases of tuberculosis of the lymph glands of the neck.
3. Sixteen cases of tuberculosis of the joints and bones.
4. Four cases of tuberculosis of the larynx.

The difficulty of differentiating between carcinoma and tuberculosis will be obviated by Koch's remedy, and the diagnosis will be positive. A better illustration of its value in this respect can scarcely be found than is afforded by these cases.

They demonstrate the fact that the subcutaneous application of Koch's remedy in those organs attacked by the tubercle bacillus, viz., the skin, mucous membrane, lymph glands, joints, and bones, produces changes which are manifest in the swelling, reddening, increase of sensibility, and disturbed functions. These phenomena do not occur in other than tuberculous tissues —such as syphilis and carcinoma—or in healthy individuals. There is no remedy which produces an action analogous to this. This fact alone is enough to arouse the greatest interest, and to render it of great therapeutical value. Through the medium of the blood the diseased spot is influenced in a visible and positive manner. The local action is associated with a high fever, producing a rapid rise of temperature, rapid pulse, icterous discoloration of the skin, headache, nausea, vomiting, pains in the limbs, exhaustion, weakness. These are the first effects of Koch's remedy.

These cases undoubtedly show, especially the patients with lupus and a child with coxitis, that the tuberculous tissues degenerate under the influence of the remedy.

The tuberculous ulcer on the alveolar process and hard palate is in process of cicatrization, one of the lupus cases is almost entirely cured, and the second case, Wachter, has lost most of the nodules, and her improvement is evident. The coxitis of Ziegelsdorf of a few weeks' duration has lost its sensitiveness, increased mobility, the swelling is hardly perceptible, and the formerly-flexed leg has been straightened without producing pain.

From all accounts the remedy should be used only in small (1 mg., $\frac{1}{61}$ ♏) doses where there is much tuberculous tissue present, and only when the site of the disease is external, or when after using small doses it is found desirable to increase the dose, should large ones be employed (in children $\frac{1}{2}$ mg. or $\frac{1}{122}$ ♏).

For use, one part of the remedy may be diluted with 99 parts of $\frac{1}{2}$ per cent. carbolic acid solution. One cubic centimetre of this solution would contain 0.010 or ten doses of 1 mg. each. This may again be diluted by taking one part of it and adding 9 parts of water, which would give (one part of the original liquid in 1000 of solution) 1 mg. in each cubic centimetre—a cubic centimetre is equivalent to ♏ xvj, or exactly ♏ xvj = 0.99 c. c. The injections are usually made by means of a special syringe which can be easily kept clean by washing in absolute alcohol and rinsing in water, though subcutaneous syringes of the ordinary pattern, but with asbestos packing in the piston, have been used.

[For the treatment of lupus and for purposes of diagnosis the remedy will probably be of value; in the treatment of tubercular diseases of the joints, in connection with surgical treatment, it seems likely to have a field of usefulness. Where the process has made little progress in the respiratory organs, there is reason to hope that we are to have a remedy better than anything thus far known, but great numbers of patients in advanced stages of consumption will be sadly disappointed.

In the treatment of tuberculous disease in animals it will probably lead to the saving of large sums, and as a prophylactic save human life by diminishing the chances of the spread of the disease to man.

Much criticism has been made about the delay in publishing the secret; but it is probably difficult to make the remedy of uniform strength and quality. The fluid is a violent poison, and carelessly-made preparations would soon bring the whole method into disrepute.

Professor Koch may feel well satisfied, not only with the results of his investigations thus far, but with the manner in which his statements have been received, for there is no one whose word commands more fully the confidence of the entire profession. Let the profession remember that the situation in which Professor Koch finds himself may be full of embarrassment, and before assuming that he has personally any ulterior motive for having withheld the secret of the preparation of his remedy, it is right to consider that in Germany his relations to his government may be such, and may since last summer have been such, as to compel him to do as he would not; in other words, his hand may have been forced from the beginning. Let us accord to Professor Koch none other than the highest, most generous, and humane motives.]

New Methods of Treating Erysipelas.

Rosenbach's method consists in washing not only the erysipelatous patch, but the entire neighboring surface, with soap and then bathing daily these patches with five-per-cent. solution of phenic acid dissolved in absolute alcohol. Very brilliant results are claimed to follow this method, both as regards the course of the disease and the febrile phenomena. Even absolute alcohol is said to produce a favorable action.

In Nolte's method the entire affected surface and surrounding zone are painted twice daily with a mucilage of gum-arabic containing from three to five per cent. of phenic acid.

The method of Koch consists in applying, by means of a camel's-hair pencil, the following ointment in a thin layer over the affected parts:

Creolin	1 part.
Iodoform	4 parts.
Lanolin	10 "

After the ointment is applied it is covered with a thin layer of gutta-percha. This method is said to be especially applicable to erysipelas of the face and of the hairy scalp.

In the method of treatment of Nussbaum and Brumm ichthyol is employed in collodion.

Hallopeau recommends the use of a solution of 1 part to 20 of salicylate of

sodium. Thick cloths are wet with this solution, then applied to the affected parts, and then covered with a layer of rubber cloth so as to prevent evaporation. Almost immediate relief is obtained, and a cure is said to follow on the third to the fifth day.

Hunter recommends the injection of carbolic acid into the healthy skin at a distance from the part infected. This method of treatment is extremely painful, and is only applicable in severe cases of the face or hairy scalp.

Dr. Kraske advises making an incision in the healthy skin around the erysipelatous patch before applying the antiseptic substance.

Wölfler makes use of mechanical compression by bandages applied so as to circumscribe the inflamed tissue, while Dr. Kraske proposes elastic rubber bands to accomplish the same effect, where these are applicable.—*Therapeutic Gazette*, No. 10, 1890.

Whooping-cough.

Bromoform	gtt. x.
Alcohol	℥j.
Distilled water	℥iij.
Syrup	℥iij.—M.

Sig.—One or two teaspoonfuls daily.

—*Revue de Thérapeutique*, No. 17, 1890.

Salol Collodion.

It is recommended to dissolve four parts of salol in four parts of ether, and then add it to thirty parts of collodion.

It is said that the application of the salol collodion to the affected parts in acute rheumatism will be followed by rapid relief of pain.—*Therapeutic Gazette*, No. 8, 1890.

[If collodion is applied to a joint it is well not to have it go completely around the limb, as collodion contracts strongly on drying, and might cause too much constriction.—Ed.]

Death from a Large Dose of Paraldehyde.

Bridget O'B., twenty years old, was admitted to the fever hospital attached to the Cork Workhouse, suffering from typhoid fever. Through an oversight on the part of the attendant, she was probably given six or seven drachms of paraldehyde. In about five minutes she fell into an unconscious state, and, despite medical assistance, she died some hours later.—*Lancet*, August 20, 1890.

Aristol.

1. Aristol has been used in a pure state in sclerosis and other ulcerations in the male and female genitals. After washing the ulcers with carbolic or sublimate water, the aristol was powdered on and covered with gauze. In ulcers on the glans penis it is necessary to remove the bandage frequently on account of priapism; in these cases iodoform has the advantage over

aristol. In syphilitic and indolent ulcers or chancres the latter acts exceedingly well. Great cleanliness is necessary, especially about the female genitals. In fresh cases aristol has no advantages over iodoform.

2. Aristol was made use of with the best results in acute otitis media and otorrhœa in place of boracic acid, in lupus laryngis, laryngorrhœa, in ulcerations of the penis, and ulcers of the leg. In burns aristol (with oil or lanolin 10 per cent.) relieved pain, and caused rapid cure.

Aristol possesses the advantages of iodoform, and can even be used in children, with whom iodoform must be used carefully.

Aristol has not a penetrating odor like iodoform.

MEDICINE.

UNDER THE CHARGE OF

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The Principles of the Treatment of Diabetes Mellitus.

Pavy (*International Med. Congress*, 1890), referring to the nature of diabetes, says that it is with the carbohydrate principles that the faulty action lies. These, instead of being consumed and utilized, remain and are eliminated as carbohydrates. This is true, whether the carbohydrates are introduced in the food, or whether they are formed by the splitting-up of nitrogenous matters within the body.

With regard to the presence of sugar in ordinary urine, the author made a series of observations some years ago in which he definitely proved that it existed there in small quantities. He also found it normally present in the blood. A further series of observations made upon the blood of seven cases of diabetes showed that the amount of sugar in it was very greatly increased, and that there was a general agreement between the amount here and that escaping in the urine. The conclusion is, therefore, justified that the larger the secretion of sugar in the urine the worse in every direction is the condition of the patient suffering from diabetes; since the unnatural state of the blood cannot but induce a deviation from healthy action throughout the system.

The question arises as to the source of this abnormality of the blood. The long experience of the author, and the experiments carried out by him, convince him that it is due to sugar reaching the general circulation in a manner it ought not. In the normal condition the ingested carbohydrates are restrained by the liver from entering the general circulation. The author has proved this to be the case by analyzing the blood in the portal vein and that in the general circulation, and showing that a large preponderance of sugar is encountered in the former, if examined after the ingestion of carbohydrate matter. It is necessary, however, to bear in mind that this sugar here found

is not in the form of glucose, and that an ordinary copper test can therefore not be depended upon to give accurate results.

These preliminary remarks show the nature of the faulty condition that has to be dealt with by treatment. If it were only a question of the waste of the carbohydrate principles of the food, there would be no reason against their being eaten and allowed to run off in the urine, provided sufficient other nourishment were given. The real harm is the result of the altered constitution of the blood, and the effects on the system in general which this alteration produces.

It may not be possible to restore the transformative or assimilative power which has been impaired or lost. Hence the only way of arriving at the desired end is to withhold from entering into the system the alimentary principles which lead to the passage of sugar through the circulation. These remarks apply to the class of cases embracing the majority of those beginning after middle life, in which the discharge of sugar is susceptible of control by treatment.

In the course of all the author's experience he has never known anything serious to arise as long as the urine was kept free from sugar. When, on the other hand, sugar is being voided, not only is the patient subjected to symptoms consequent thereon, but he is in constant danger of the supervention of more serious issues known to follow upon the disease.

The first consideration, therefore, is to control by dietetic measures the passage of sugar through the system. The real point, however, to be aimed at is the restoration of the assimilative power over the carbohydrate elements of the food. What most conduces to this restoration is the maintenance of a normal state of the system by keeping sugar from passing through it, and in this way bringing a healthy condition of the body to bear in helping to promote a removal of the faulty state.

Opium and its derivatives are, in the author's opinion, the medicinal agents which most assist in the actual cure of the disease and the restoration of the assimilative power. The benefit to be derived from these agents is often seen in cases in which mere dietetic treatment has reduced the sugar to a certain point, but fails to remove it entirely. When cases of a favorable nature are treated by these combined measures, the system of the patient frequently becomes finally able to tolerate a certain amount of carbohydrate food with benefit; but care must always be taken to keep the amount below that which produces an elimination of sugar in the urine.

When a case is found to have the assimilative power restored, it is permissible to call it *cured;* always remembering, however, that a weak point has existed which must not be unduly taxed.

On the Influence of Hunger on the Susceptibility to Infectious Diseases.

Canalis and Morpurgo (*Fortschr. d. Med.*, 1890, Nos. 18 and 19) refer to the commonly-accepted idea that hunger and other weakening conditions predispose to the development of infectious diseases, but say that this has never yet been proved by detailed experiments, at any rate as regards insufficient nourishment. They give abstracts of the brief notices which have

appeared in medical literature bearing upon this subject, and then proceed to detail their own experiments.

The bacilli of anthrax were chosen as those with which to experiment, and pigeons, chickens, and white rats as the animals to be experimented on, since these animals are possessed of comparatively greater resistance to the bacilli, and therefore permitted of observations on differences in the degree of susceptibility.

Series of experiments were performed on pigeons by inoculating them after starving them for several days, or by beginning the starving process immediately after the inoculation was performed, or by starving them first and then beginning to feed them at the time of inoculating them, or, finally, by inoculating at the time the starving was commenced, and later feeding them again. In other cases the whole or the greater part of the pancreas was removed before inoculation, since this gland is especially important to animals which consume cereals.

Observations were also made upon the vitality of the anthrax bacilli after being introduced into the bodies of pigeons.

Experiments of a similar nature were performed on chickens and on white rats, both of which animals are even more resistant to infection by anthrax bacilli.

The effort was also made to determine whether the depression of temperature which accompanies a starving condition was itself the actual cause of loss of immunity against the disease.

The authors deem the following conclusions justifiable:

1. Animals naturally immune from infectious disease can be made susceptible through hunger.

2. Pigeons, usually immune, always die of anthrax when starving is commenced at the time of inoculation.

3. Pigeons which have been starved during six days before inoculation do not take anthrax if feeding is at once commenced immediately after inoculation. If the starvation lasted more than six days they, as a rule, take the disease.

4. The readministration of food will retard the course of, but will not prevent the development of anthrax if the pigeons are allowed to fast during two days after inoculation.

5. Total or partial extirpation of the pancreas usually renders pigeons susceptible to anthrax during a limited time.

6. Anthrax will finally develop in inoculated pigeons, even if starving is not commenced until eight days afterward. Hence:

7. The bacilli of anthrax, introduced under the skin of immune pigeons, remain alive and virulent for several days.

8. The loss of immunity in pigeons cannot depend on the depression of temperature accompanying starvation, since the disease is not taken if a similar depression be produced in other ways, and the animals be meantime abundantly fed.

9. Chickens also may be made susceptible to anthrax through hunger.

10. The majority of the animals of this species died of anthrax if they were made to starve for three to seven days before inoculation, and after it

also until dead. They do not, however, take the disease if starvation is commenced only at the time of inoculation.

11. Adult white rats experimented on remained entirely immune from anthrax, even when allowed to starve a comparatively long time before inoculation.

The Nature and Treatment of Tabes.

Strümpell (*Münch. med. Wochenschr.*, 1890, 39, 667), in an interesting article upon this subject, says that, though there are so many and so varied symptoms of tabes, there are certain of them which seem to be almost invariably present. Such are the three initial symptoms—the evidence of sensory irritation in the skin, legs, arms, trunk, or head, the abolition of the patellar reflex, and the characteristic alteration of the pupil. In a later stage are almost constantly seen the development of certain disturbances of sensation, of bladder symptoms, and of ataxia of voluntary motion. To explain these facts, we should have to assume, even if we knew nothing of its pathological anatomy, that the disease was one in which certain tracts of fibres in the brain and cord were affected according to some law. The determination of just which fibres is, however, a matter of exceeding difficulty. That the degeneration is nevertheless systemic seems now proven beyond a doubt.

We may define tabes as an exceedingly complicated disorder of the nervous system, in which there are in the peripheral nerves, spinal cord, and brain numerous tracts of fibres diseased with at least partial involvement as well of the ganglion cells from which the fibres arise. The disease always begins as a degenerative atrophy of the nerve-fibres. Its distribution always stands in the closest relations to the physiological property of the fibres. Certain systems always become easily and completely diseased, while others are more rarely or only slightly affected. The order in which the fibres are attacked is by no means always the same, though certain rules seem to obtain. The rapidity, too, with which the disease extends from one system to another is subject to great variations. Its point of starting, too, may be most variable.

As regards the cause of tabes the author denies the active influence of exposure to cold, excesses, traumatism, and heredity. He agrees entirely with Fournier, the first to claim that tabes occurred almost or quite exclusively in those who had at some earlier period in their lives suffered from syphilis. He has yet to see a case in which the possibility of a preceding syphilitic infection could be positively excluded. It is a mistake, however, to consider tabes as at all a form of tertiary syphilis, due to a syphilitic affection of the vessels; for the anatomical changes are totally different from syphilitic new-formations, and antisyphilitic treatment is usually entirely unavailing. The degenerative changes of tabes are to be considered as the result of a post-syphilitic intoxication of the body. Thus it is exactly analogous to the paralyses seen after diphtheria; which are the result of a widespread degeneration of the nerves, which has nothing anatomically in common with the primary diphtheritic changes. The nerve-lesions in diphtheria are simple degenerative conditions due to the action of a chemical poison arising within the body. The origin of tabes the author believes to be similar to this. As in the case of all other toxic degenerations of like nature, there

exists an intimate connection between the nature of the poison and the nerve-fibres acted upon; each poison being a poison for only certain regions of nerve-tissue, and harmless to others. In this way it can be understood why tabes must be a systemic affection. It is also clear that though mercury and iodine may destroy syphilitic new-formations, they need not be at all active against a chemical toxine.

The author believes that the various crises are best accounted for on the ground that they are of toxic origin. In fact, he knows of no other way to explain them with any satisfaction.

In opening his remarks on the therapeutics of tabes the author refers to several points which he thinks deserve more attention than is usually accorded to them. First, that slight or rudimentary cases of tabes are not of rare occurrence. It is possible that such cases, suffering only from the earliest symptoms, may have all the indications of nerve-irritation disappear, and no further advance be made in the disease.

A second important point is, that there is seen in tabes the sudden failure of certain nerve-functions, which may then gradually recover their previous condition—it may erroneously be supposed, under the influence of therapeutic measures. He believes that these conditions are the result of the sudden inhibitory action of the poison on certain nerve-areas, without there being any actual destruction of them. Recovery takes places just as in cases of severe morphine-narcosis, curare-paralysis, and the like, after the action of the toxic agent has ceased.

The third point of prognostic-therapeutic importance is that all circumstances producing over-strain or weakening of the body in general, or particularly of the nervous system, diminish the resisting power of the nerves to the morbific agent; while the reverse is likewise true, that proper hygienic and dietetic measures exert an inhibitory influence upon this agent. The author particularly emphasizes the importance of avoiding all over-exertion in cases which have as yet shown no traces of affection of the gait.

As to the treatment of tabes, it is evident that no great influence can be exerted in any way upon nerve fibres already atrophied. The treatment by suspension may, in many cases, be followed by temporary symptomatic benefit, but certainly, he believes, never by any permanent good.

The antisyphilitic treatment can be of no avail against the disease as already developed. It may, however, be tried for two reasons. First, it is conceivable that syphilis still exists in the body, and that by the employment of inunctions in early cases of tabes, the development of further changes may be prevented or at least retarded. He confesses that he has not much hope of any such action. A second reason is that a true specific syphilitic affection of the nervous system—as a gumma—may develop, giving rise to symptoms like those of tabes, or that such a growth may be present in addition to the true tabetic changes. Since it is by no means easy to determine this matter positively during life, the energetic and prompt employment of treatment by inunction is highly to be recommended. We have not yet learned the true method of treatment, which is the employment of such methods as will modify or render powerless the chemical processes going on in the diseased body.

A Parasitic Protozoa in Carcinomata.

Sjoebring (*Fortschr. d. Med.*, 1890, No. 14, 529), in studying the process of nuclear division in the cells of a carcinoma of the breast, noticed peculiar bodies which he subjected to a careful investigation and discovered them to be microörganisms. He describes these and illustrates their life-history in a lithographic plate.

This microörganism first appears in the form of an exceedingly small, round, protoplasmatic body; seeks a cell-nucleus; penetrates it, and remains there during the first stage of its existence. It then passes out into the body of the cell, or even entirely outside of this. In this period of its existence it grows at the expense of the cells of the tumor, and particularly of their nuclei, its destroying influence being exerted not only on the single cells but upon the entire surrounding tissue. When the microörganism has reached full maturity it nearly fills the cell containing it. At this period it surrounds the cell-nucleus, softening its lining membrane, and absorbing its contents into itself; the achromatin of the nuclear protoplasm appearing in the form of hyaline drops, filling the greater part of the plasmodium, and the chromatin forming a little mass among these.

A membrane now develops around the plasmodium, the hyaline drops become changed into a more homogeneous mass; very minute, curved, rod-like bodies develop in this, and are each surrounded by a small, hyaline, highly-refractive mass, which finally becomes distinctly encapsulated. These fully-developed spores, to the number of twenty or thirty, are contained within and fill the plasmodium as in a spore-cyst; through which they probably finally burst. The rod-like bodies probably last of all burst through the capsule of the spore and develop into the young sarcodes at first described.

The author was never able to discover a nucleus colorable with hæmatoxylin at any period of the development of the microörganism. On this account he classifies this body as a sporozoa, probably belonging to the group of the microsporidia.

The size of these microörganisms varies greatly, from one or two up to fifteen micro-millimetres in diameter. As regards the frequency of their occurrence the sarcode forms are very numerous, several being found in each cell, apart from those occurring in the nuclei. The larger forms, connected with the spore-formation, are seen much more rarely.

The author has found this parasitic body in six out of seven cases of cancer of the breast in which he has sought for it. In the seventh case it was not to be discovered with certainty.

In two other cases of cancer of other parts of the body, he has sought for and found them.

Uric-Acidæmia.

V. Jaksch (*Deutsche med. Wochenschr.*, 1890, 33, 741) has examined the blood of patients in the effort to determine:

1. Whether uric acid took part in the acid intoxication occurring in febrile conditions.

2. Whether it took part in the production of gout or attacks of gout.

He refers to the statements which have already been made in support of this view, but says that investigations in the matter have never been carried out on a large number of patients.

In all he examined the blood of 105 cases in a manner described by him. In 9 instances of healthy individuals no uric acid was found. In nervous diseases it was also absent, and the same was true of 9 cases of typhoid fever. In another case of this disease and in one of intermittent fever there was no uric acid present during the elevation of temperature, though it was detected after fever had disappeared.

In the instances of diseases of the liver, stomach, and intestine examined, uric-acidæmia was only observed when anæmia was also present.

The acid was found in diseases of the heart which produced cyanosis, as also in emphysema and pleural exudates. It was constantly present in considerable quantity in the febrile stage of five cases of pneumonia. In six cases of acute articular rheumatism there was no uric-acidæmia observed.

Very considerable quantities of uric acid were found in all the cases of diseases of the kidneys, and in those of primary and secondary anæmias.

These observations seem undoubtedly to prove that uric-acidæmia is not a pathognomonic symptom of gout, and that it is not a factor in the production of the acid intoxication seen in fever. Fever, indeed, appears to influence unfavorably the production of uric-acidæmia.

It is a noticeable fact that it occurs in renal diseases, anæmias, and in all processes in which the blood is overloaded with carbonic acid. Even in pneumonia the fever is not sufficient to neutralize the action of the carbonic acid in producing this condition.

He does not hesitate to state that uric-acidæmia is due to disease of the red blood-cells, the oxygen-carriers of the blood. Thus, in cyanosed conditions the carbonic acid diminishes the vital energy of the blood-cells; in nephritis, they are not capable of neutralizing the large amount of retained uric acid, and in anæmia the cells are not sufficient in number, and uric-acidæmia therefore appears.

The Pathology of Paroxysmal Hæmoglobinuria.

Copeman (*Practitioner*, 1890, xlv., 3, 161) records a series of careful observations made upon seven cases of paroxysmal hæmoglobinuria. He details the clinical histories of these cases, the important features being that exposure to cold for a short time would be immediately followed by shivering and blueness, with depression of the bodily temperature. An elevation of temperature next took place, accompanied by hæmogobinuria. Various experiments were performed by varying the duration and method of exposure to cold. The influence of local cold was determined by dipping the hands in cold water, etc. The blood was also drawn from the finger and examined during the period of hæmoglobinuria, and the evidences of the destruction of the red blood-corpuscles noticed.

The results of these observations and experiments showed that one of the first and most obvious phenomena of the disease consists in an enormous and rapid destruction of the red blood-cells, depending on the direct influence of

cold. The remaining red blood-cells lost consistence and exhibited great irregularity in shape; while the plasma was tinted by the escaped hæmoglobin and contained masses of hæmatin. That these changes were in reality dependent on cold was further shown by the experiment of placing a ligature around a finger and then immersing the finger in cold water. The blood in this finger alone underwent alteration. Accompanying the pigment in the urine was a proteid consisting mainly of globulin. The pigment from the broken-down corpuscles is originally excreted as oxyhæmoglobin, then passes through a preliminary stage of methæmoglobin before becoming converted into acid hæmatin while in contact with the acid urine in the bladder.

The author discusses the nature of the varieties of hæmoglobin, classifying them as—1, acid hæmoglobin (methæmoglobin); 2 and 3, alkaline hæmoglobin (oxy- and reduced); 4, acid hæmatin; 5 and 6, alkaline hæmatin (oxy- and reduced).

Just as acid hæmatin can be changed by the action of reagents into either form of alkaline hæmatin, so methæmoglobin can be converted into either variety of alkaline hæmoglobin, and the process may be repeated backward and forward any number of times.

It appears probable that paroxysmal hæmoglobinuria is only an exaggeration of a physiological phenomenon. The red blood-corpuscles are constantly undergoing destruction in the circulation during health, but the products of this destruction are used up in the system. If the destruction be only, though during some time, just beyond the normal limit, the system is unable to make away with the products, and albumin appears in the urine. If the destruction be great, though only for a short time, hæmoglobin will appear as well; or methæmoglobin if the pigment be retained in the tubules of the kidney or in the bladder for any length of time.

It has been shown by several writers that temporary albuminuria may follow cold bathing or other exposure to cold in persons otherwise apparently healthy. It has also been found that this occurs at time in persons subject to paroxysmal hæmoglobinuria. In the light of what has been stated, the author deems it impossible that either of these affections can be due to disease of the kidneys.

It cannot, however, be denied that there must be some peculiarity of the red blood-cells in paroxysmal hæmoglobinuria which renders them unduly sensitive to the influence of cold. This is probably to be sought in some disorder of the blood-making apparatus which renders the corpuscles less resistant. This is borne out by the fact that the corpuscles in these cases tend to assume fantastic shapes on the slightest pressure, and do not run into rouleaux, even when there has been no paroxysm for a length of time. Syphilis is a probable cause of this diseased condition. It was present in all of the eight cases reported. Malaria and gout may possibly also exert some influence.

The Diagnostic Value of Tubercle Bacilli in the Sputum.

Fussell, in 1887, published the results of his examination of the sputum for tubercle bacilli in 100 cases of pulmonary disease, and concluded that the presence of the bacilli was proof positive of the existence of tuberculous

phthisis, while their continued absence was good, though not positive, proof of the absence of phthisis.

FUSSELL and KEILY (*Univ. Med. Mag.*, 1890, iii. 85) now publish a further series of 65 cases, in which the examination of the sputum confirms these conclusions. Of the 65 cases, 44 had undoubted physical signs of phthisis; 4 had doubtful physical signs, yet tubercle bacilli were found in all. The authors give the further clinical history of these 4 cases, which later progressed as ordinary cases of phthisis.

8 cases had no physical signs of phthisis, and bacilli were absent from the sputum of all of them. 9 cases had doubtful physical signs, and bacilli were absent in all. These 9 cases were of especial interest, since in some of them it seemed exceedingly probable that phthisis was present. All of them, however, recovered.

CONTRIBUTION TO THE STUDY OF THE MOVEMENTS OF THE STOMACH, PYLORUS, AND DUODENUM.

A valuable paper appears from the pen of ROSSBACH (*Deutsch. Arch. f. klin. Med.*, 1890, B. xlvi. 276) on the movements of the stomach, pylorus, and duodenum. He reviews what has been done by investigators in the study of the subject, and then details his own observations and experiments. The experiments were performed entirely upon dogs, and consisted in first rendering the animal as quiet or as insensible to pain as possible by the use of curare or morphine, then exposing the stomach and preserving it in as normal a condition as possible by the application of warm, wet cloths, or by filling the abdomen with warm physiological salt solution and then covering it with a warm glass-plate. After this preparation, observations were made upon the movements of the stomach and duodenum, and on the state of the pylorus under different conditions of fulness and emptiness of the stomach and under such influences as irritation of the vagus or the ingestion of cold or hot water.

The results of these observations were as follows:

1. *Stomach.* In the case of the stomach when full of food the peristaltic movements were at first weak, and then, becoming stronger, lasted 4–8 hours. They occurred only in the half of the stomach nearest to the pylorus, the other half was entirely free from movements during the whole period of digestion, and compressed only moderately the gastric contents. The movements always began about the middle of the stomach—the first appearance being as though a cord were deeply constricting the organ—and then passed in waves toward the pylorus, each wave consuming about twenty seconds in its passage. The wave-like motion was so deep at the acme of the digestive period that it temporarily obliterated the lumen of the stomach. Especially was this the case as the wave approached the pylorus. The presence of not too large a quantity of cold or warm beverages increased the force of the peristaltic movements. Large amounts of cold water, however, stopped them entirely for a long time, and made the organ icy cold. Deep morphine- or chloroform-narcosis weakened and retarded them greatly, without, however, causing them to cease during digestion. Section of the spinal cord at the region of the second cervical vertebra, or of the œsoph-

ageal vagus, had a similar effect. After section of the cord the general tension of the stomach upon its contents was lost, and as a result the organ became decidedly larger than in the case of animals whose nervous system had remained intact. If after section of the vagus the serous layer of the stomach was irritated by the faradic current, a powerful contraction was produced at the seat of irritation, but did not advance beyond this point. Faradic stimulation of the cut œsophageal vagus, however, even shortly after death, produced powerful, wave-like contractions in the pyloric half of the stomach, similar to those described.

The empty stomachs of dogs which had fasted from twenty-four to seventy-five hours were small, flaccid, and either entirely without movements, or exhibiting only rarely a weak contraction.

2. *Pylorus.* Observations on the pylorus showed that when the stomach was full it was closed during the whole period of digestion, and for the first four to eight hours did not allow a single drop of nourishment to pass it. Toward the end of digestion the finger could with difficulty be pushed through it from the duodenum, but not before this time. The emptying of the stomach took place suddenly in four or five squirts, the result of a single peristaltic contraction no stronger than those which had preceded it. After more inefficient contractions one again succeeded in expelling some of the food, and then again each contraction for a time drove food into the duodenum. These observations prove that the emptying of the stomach is accomplished not only by the gastric contraction, but that the pylorus has the independent power of opening and closing.

As for the condition of the pylorus when the stomach is empty, our knowledge is not so definite. In all the author's experiments on dogs which had had no food for from twenty-four to seventy hours the pylorus was found closed, and resisted the pressure of the finger from the intestine, though not so powerfully as during digestion.

Section of the vagus or decided curarizing of the animal caused the pylorus to open even when the stomach was full; but section of the cervical cord at the second vertebra was without effect. Irritation of the gastric mucous membrane of the stomach increased the contraction of the pylorus; while irritation of the mucous membrane of the pylorus appeared to diminish the gastric peristalsis. This relation probably prevents the stomach from sending too much of its contents into the duodenum at one time.

The ingestion of much cold water intensified the contraction of the stomach for a time, but relaxed the pylorus completely, so that the large amounts of fluid rapidly passed into the intestine, thus preventing too great a dilution of the food. This opening of the pylorus occurred whether the stomach was full or empty.

3. *Duodenum.* During the whole of the process of digestion the duodenum was entirely without movements of its own. Even when mutilated or irritated in most various ways no movement could be produced. The secretion of the intestinal juices, bile, and probably of the pancreatic juice went on, however, continuously during the digestive period. About the time when the pylorus opens, just before the gastric contents pass through it, peristaltic movements began in the duodenum and continued and increased in strength until the stomach had entirely emptied itself.

It is evident that there must be a nervous connection between the innervation of the stomach, of the pylorus, and of the duodenum. The physiological law might be formulated that irritation of the gastric mucous membrane acts reflexly, producing a stronger innervation of the pyloric muscle, and an inhibition of the movements of the duodenum, but finally a relaxation of the pyloric muscle and an irritation of the motor nerves of the muscle of the duodenum. The result of the resting of the duodenum during gastric digestion is clearly to prevent the removal of the intestinal secretions poured out in the bowel, in order that they may remain in the immediate vicinity of the stomach ready to neutralize and act upon the acid gastric contents when these are finally passed out.

SURGERY.

UNDER THE CHARGE OF

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A Remarkable Case of Intestinal Obstruction.

Dr. Wallace Beatty (*Dublin Journal of Med. Science*, third series, No. 126) reports in detail a case which he saw with Sir William Stokes and with Dr. Head, and the course of which he summarizes as follows, the patient being a boy ten years of age: A sudden commencement—the first symptom being abdominal pain followed by diarrhœa, and in about twelve hours by vomiting. The symptoms during the first four days not very urgent; his condition then was abdominal pain of moderate severity, tenderness on pressure in the right iliac fossa, some tension of the abdominal walls, a temperature of 99°, a rather weak pulse, and a thinly-furred tongue.

From the fourth day until the nineteenth—*i. e.*, until the termination of the first stage—his condition was: 1. Some diarrhœa; the motions were sometimes liquid, sometimes formed, never scybalous. 2. Some fulness and tension of the abdominal walls; this was not at all great, and seemed to lessen each day. 3. Slight tenderness in the right iliac fossa. 4. Moderate fever, the highest temperature reached being 101°. 5. A small, indistinctly-felt tumor in the right iliac fossa, present at the end of this stage; and 6. No vomiting. Most of this time the boy felt very well and hungry, and was disappointed at being kept on low diet.

The treatment during this stage was a restricted liquid diet, a few drops of Battey's solution every three or four hours, leeches and wet compresses to the right iliac fossa.

The symptoms during the second stage were—a sudden change in the boy's

condition, this change consisting in paroxysms of severe abdominal pain, vomiting, distention of the abdomen, and obstinate constipation. From the commencement of this stage until it terminated the symptoms were briefly as follows:

1. Rapidly-increasing distention of the abdomen, commencing in the umbilical region, and subsequently involving the whole abdomen. 2. Paroxysms of abdominal pain, becoming each day more and more agonizing and subdued only by repeated hypodermic injections of morphine. 3. Vomiting frequent, but fluctuating, not constant, bilious, once or twice fæculent. 4. Obstruction of the bowels almost complete. On only a few occasions some wind and a scanty amount of fæces came away, without giving any relief. 5. Rapidly-increasing emaciation, which became finally extreme. 6. A normal or subnormal temperature. 7. A pulse of fair volume during the greater part of the time, and of moderate frequency—*i. e.*, under 100. Until toward the termination of this stage it was never extremely rapid. 8. At times difficulty in micturition and more or less tenesmus. 9. A sudden relief to the obstruction, occurring when the boy was almost dead.

With regard to the third period—*i. e.*, from the termination of the illness until the present, there are two events to record—the attack of paroxysmal abdominal pain which occurred during convalescence from his illness, and the attack of diarrhœa and vomiting which occurred some months after, and lasted about two days.

On reviewing the case, the diagnosis seems to rest between—(*a*) An intussusception. (*b*) Typhlitis leading to obstruction by producing local paralysis.

The question of intussusception is one deserving of some consideration. There are, undoubtedly, some points in the case which favor this diagnosis: 1. The suddenness of the onset. 2. The first symptom being sudden pain. 3. The presence of diarrhœa during the first part of the illness, which in intestinal obstruction is suggestive of intussusception. 4. The moderate distention of the abdomen for several days. 5. The fact that an indistinct tumor was felt in the right iliac fossa for a couple of days. 6. The change in the symptoms on the nineteenth day may have been due to an increase in the invagination leading to obstruction. 7. The sudden relief may have been due to spontaneous reduction of the invaginated bowel, the other method of spontaneous cure being excluded by the fact that no portion of gangrenous intestine was subsequently discharged.

The chief difficulties which lie in the way of acceptance of this diagnosis are:

1. The early fever. Still, in some cases of intussusception fever has been noted. Treves, in his excellent manual on *Intestinal Obstruction*, when speaking of the temperature in intussusception, says: "It will be below normal in cases associated with shock. In the majority of the cases, and especially in such as are subacute, it is normal, or a little above normal. It is important," he continues, "to recognize the fact that there may be a rise of temperature in intussusception apart from any evidence of local peritonitis. 2. The early local tenderness in the right iliac fossa. 3. The absence of bloody stools. 4. The long duration of the illness, which would be greatly against the possibility of spontaneous reduction, as it would be very unlikely

that adhesions would have formed precluding the possibility of such reduction.

How is the attack of pain with visible peristalsis, which occurred during convalescence, to be explained if we assume that the illness was due to intussusception? Perhaps it was due to a fresh invagination which reduced itself, or, perhaps, to a temporary obstruction due to a weakened condition of that part of the bowel which had been invaginated.

The question of typhlitis remains to be considered. During the first stage of the illness Dr. Beatty believed that the case was one of typhlitis, on account of the early tenderness on pressure in the right iliac fossa, the abdominal tension, the fever, and the presence, after some days, of a small tumor in the situation of the cæcum. The sudden onset is quite compatible with typhlitis, as it usually begins suddenly.

The sudden intestinal obstruction which occurred on the nineteenth day would be accounted for by paralysis of the cæcum, due to inflammation. This was Sir William Stokes's view; and, taking all the symptoms into consideration, it seems to be the true explanation of the case. But there are, no doubt, some difficulties in the way of accepting this view.

1. Why was diarrhœa present during the early part of the illness? Constipation is the rule in typhlitis.

2. How did the obstruction give way? Perhaps it was that on the approach of death a general relaxation of the intestines took place, and as the accumulated contents of the cæcum made their way out.

3. If the typhlitis was severe enough to produce paralysis of the cæcum, is it not strange that the inflammation did not spread to the cellular tissue behind the cæcum and lead to perityphlitis and abscess? There was no evidence of suppuration either during or after the illness.

The Treatment of Subcutaneous Rupture of the Ligamentum Patellæ.

A case of this rare injury, together with a non-operative method of treatment entirely satisfactory in its result, is detailed by Brunner (*Correspondenzbl. für Schweiz. Aerzte*, No. 19, xx. Jahrg). According to Maydl, of forty-six cases suffering from an injury of this nature and treated by means other than incision and suture, twenty-seven were entirely cured, while the remainder suffered from a greater or less disturbance of function. It is certain, however, that many of the imperfect cures were due to intercurrent traumatism or to an imperfect or not sufficiently long-continued treatment, and, moreover, that the majority were reported before sufficient time had elapsed to allow of complete restoration of function. Hence the statistical study does not offer a fair basis for a calculation of the chances of success attendant upon treating subcutaneous rupture of the patellar ligament by splints and compresses.

In the case reported, the patient, a heavy man, aged forty-four years, exhibited for many years the characteristic symptoms of the rheumatic diathesis. From comparatively slight violence he sustained a fracture of the tibia just below the knee-joint. For this he was required to wear a splint for a long time. Some months later, while in the act of sitting down, he heard a crack in the

knee-joint. He did not suffer much pain, but found that he was absolutely unable to extend the leg. On examination, the knee-joint was found to be slightly swollen, and the patella was drawn two inches upward from its normal position and was freely movable from side to side. For twenty-four hours the treatment consisted in flexing the thigh upon the body and dressing the limb upon a Volkmann splint; then the leg was brought into a position of maximum extension and a plaster bandage was applied. In eight days this fixed dressing was removed, and the injury was dressed precisely in the manner advised by Trélat in the treatment of patellar fractures. Immediately above the superior border of the displaced patella was fitted a gutta-percha plate; this was secured in position by strips of adhesive plaster carried circularly around the thigh. Over this was applied a plaster bandage extending from the toes to the groin; this was allowed to harden while the leg was held in a position of extreme extension. On the following day an oval trap was cut in the plaster large enough to expose the gutta-percha plate and extending downward to the tuberosity of the tibia. One extremity of the Malgaigne hook was now secured to the gutta-percha plate, the other to the plaster bandage covering the upper extremity of the tibia. On turning the screw the patella was readily drawn to the normal position, except that its lower edge tilted somewhat forward. This was corrected by a compress. After twelve days the patella was found to be secured in its normal position by the healing process. The plaster bandage was allowed to remain for eight days, and was then replaced by an articulated salicylate bandage. Six weeks after the injury the patient was allowed to leave his bed, but no flexion was permitted in the knee-joint for several days. Then the articulated dressing was so arranged that slight flexion was possible; gradually greater freedom of motion was allowed, till in ten weeks flexion to almost a right angle was possible and extension was perfect. Five years later the patient showed absolutely no trace of the injury, the function of the leg being perfect.

The Operative Treatment of Thrombosis of the Sinuses.

Since Dr. Lane reported a case of septic thrombus of the lateral sinus successfully treated by trephining of the skull, followed by incision into the venous channel and evacuation of its purulent contents, the outlook for operation in cases of intra-cranial complications dependent upon otitis media has been decidedly brighter. Two more cases, one resulting fatally, the other recovering, are now reported by Salzer (*Wien. klin. Woch.*, iii. Jahrg., No. 34). The first case gave a history of discharge from the left ear of many years' duration. Shortly following mechanical irritation, occipital headache, fever and vomiting were noted; followed by pain referred to the cervical vertebræ, swelling of the spleen and the physical signs of lobular pneumonia. The pulse was abnormally slow. An examination of the urine showed blood, hæmoglobin, albumin and pus. In a few days the mastoid region was tender, swollen, and œdematous, the patient at the same time becoming somnolent and apathetic. On incision, a pus-discharging opening was found at the posterior border of the temporal bone. The dura was exposed by means of the chisel; a considerable amount of extra-dural pus was evacuated, and the lateral sinus was laid open and cleared of a septic thrombus. The exploring-needle failed

to find pus-collection in either the temporal lobe or in the cerebellum. Death followed seven days later from septicæmia and lobular pneumonia. The autopsy showed diffuse suppuration beneath the dura and tentorium, and a thrombus extending from the left into the right lateral sinus.

The second case also suffered from a long-standing middle-ear disease on the left side. The characteristic symptoms of intra-cranial involvement were: apathy, somnolence, with delirium at times, hyperæsthesia, and epileptiform convulsions of the right side of the body, trismus, disturbance in speech, rigors, fever, and, finally, tenderness and swelling over the mastoid process. On opening the skull much pus was evacuated. An area of sphacelated dura was excised, the non-pulsatile sigmoid sinus was incised, and pus and septic thrombi were evacuated, and the wound was packed with iodoform-gauze. Recovery, though slow and complicated by prolapse of the cerebrum, was complete.

The most characteristic symptoms of septic thrombosis of the lateral sinus are, probably: tenderness along the course of the internal jugular vein, evidences of disturbed circulation in the region of the ear, and the symptoms attendant upon emboli being carried to other parts of the body. None, however, are pathognomonic, so that the diagnosis can only be made at the time of operation. Puncture with the needle of a hypodermic syringe will at once determine whether or not the lumen of the venous channel is occluded. If its contents are septic, immediate evacuation is the only rational treatment.

Treatment of Certain Forms of Intestinal Obstruction.

Jessett, after detailing (*Medical Press*, New Series, vol. l., No. 2684) some original experiments, formulates the following conclusions: 1. Obstruction of the intestines, the result of constricting bands or volvulus, is always met with either in the small intestine or the sigmoid flexure. 2. The most common cause of bands is old peritonitis, local or general; Meckel's or other diverticula may be the cause of constriction of the bowel by snaring or twisting. 3. The predisposing causes of volvulus consist in elongation of certain segments of the intestine, abnormal length of the mesentery, adhesions, or unequal peristaltic action. 4. The higher in the intestine the obstruction the more severe usually are the symptoms. 5. All cases of obstruction should be treated by early abdominal section, and, if possible, reduction of the constricted portion of the intestine by dividing the constricting bands or untwisting a volvulus, that is, if the gentle insufflation of hydrogen gas fails to effect reduction. 6. In all cases where the intestine is very distended, it should be freely incised and its contents evacuated. 7. In all cases in which the constriction is irreducible lateral anastomosis by approximation disks should be practised so as to exclude permanently the seat of obstruction from active fæcal circulation. 8. In cases where gangrene has taken place in the loop of constricted intestine, it should be excised, and the portion of intestine above and below the seat of constriction should be united by lateral anastomosis by approximate plates, the divided ends being invaginated into themselves. 9. All bands and diverticula should be removed when practicable at the time of operation; in the case of volvulus, if the mesentery is abnormally long, it should be shortened. 10.

That enterostomy, or the formation of an artificial anus, should never be performed unless it is found to be absolutely impracticable to reëstablish the continuity of the intestinal canal by dividing the constricting bands by enterorrhaphy or by means of lateral apposition as described.

Suture of the Bladder.

In an elaborate article (*Annales des Maladies Org. Genito-urin.*, vol. viii., No. X.) upon the suture of the bladder, Dr. Delefosse arrives at the following conclusions:

1. Vesical suture should not be employed in at least two-thirds of the cases of hypogastric section, on account either of the object of the operation itself, or of the condition of the vesical walls, or of the interior of the bladder.

2. It is only absolutely indicated when there is an intra-peritoneal wound of the bladder wall. When a wound of the bladder is extra-peritoneal, vesical suture should be employed when the bladder and kidneys are healthy and the urine is normal.

3. In the great majority of cases of hypogastric section in which the use of the suture has succeeded, a partial suturing or none at all, with the employment of siphon drainage, would give equally good results.

Delefosse concludes his article by quoting, with approval, the opinion of Hache, who says that the dangers associated with complete suture are not compensated for by the advantages which may result from it.

Empyema of Gall-bladder.

Dr. West Hughes (*Annals of Surgery*, vol. xii., No. 5) reports a case of suppurating gall-bladder, with cholecystotomy, in two stages, and recovery, giving his reasons for selecting that method: In empyemic distention the walls of the gall-bladder are thickened, non-elastic, and somewhat friable. It would be a difficult proceeding to evacuate the contents through a trocar or by aspiration, enlarge its opening and suture its edges to the wound, without allowing some of the fluid to escape into the peritoneal cavity. In simple distention, the walls being thin and elastic, there would be no necessity for performing the operation in two stages. In such cases the opening in the gall-bladder and the abdominal wound may be sutured separately, the gall-bladder being returned to the abdominal cavity. But a simpler and safer oparation (Tait) is to suture the edges of the bladder-opening to the edges of the wound and insert a drainage-tube into the bladder. At the end of a few days the tube can be removed. Then if the obstruction has been entirely relieved, the fistula will readily heal. If the obstruction still exists (and of this the operator can never be absolutely sure at the time of operation), even if the fistula should close and the distention recur, the wound could be torn open with the finger, or with some blunt instrument, without the administration of an anæsthetic. But if the gall-bladder should have been sutured separately, then in case of a recurrence another operation would be necessary. The indication that there was no longer any obstruction in this case was the escape of bile from the fistula, the

contents of the gall-bladder at the time of operation being entirely free from bile. Of course, there never was any obstruction in the common duct, since there was never any jaundice.

Excision of the Chancre to Abort Syphilis.

H. Leloir (*Journal de Médecine*, No. 42, vol. ii. p. 618, 1890) reports two interesting cases of excision of chancre. The first was the case of a young man who had had connection with a syphilitic woman. Medical examination made on the day after coitus showed that the woman had chancres and glandular involvement; and some days later the appearance of roseola and mucous patches. The young man was placed under close observation, and directed to examine himself very frequently.

Nineteen days after the coitus a papule appeared on the prepuce. This was excised freely, and the base cauterized upon the morning of its appearance. No glandular involvement could be detected. Six weeks later the symptoms of constitutional syphilis were developed.

In the second case, a man who had never had syphilis, contracted a sore on the prepuce from a woman, who was proved, by medical examination, to be syphilitic. The sore appeared twenty-four days after coitus, and presented every appearance of a chancre. There was slight induration of the inguinal glands, which the patient stated had existed before the appearance of the sore. The chancre was excised five days after it was first observed. The wound healed readily without induration. The man was kept under observation for four months, and examined carefully twice a week, without the appearance of any symptoms of syphilis.

OTOLOGY.

UNDER THE CHARGE OF

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Operation for Exostosis of the External Auditory Meatus.

Dr. Heiman, of Warsaw, reports (*Archives of Otology*, vol. xix., July, 1890) a very interesting example of obstructive exostosis in the auditory canal, with an operation for its relief.

A man, twenty-six years old, had suffered long from purulent otorrhœa in the left ear. At last, in August, 1888, he noticed that the discharge was not so great, and at the same time he suffered from violent headache in the corresponding temporal and occipital regions. Examination now revealed a slight paresis of the left side of the face, and slight percussion of the left temporal and mastoid regions was painful. The bony external auditory canal was occluded by a bony tumor, sensitive to the touch, but immovable,

its broad base corresponding to the upper and posterior part of the canal. The skin covering it was somewhat reddened. The deeper parts of the ear could not be cleaned. Upon inflation a quantity of offensive pus oozed out through the chink between the growth and the opposite meatus wall, and then the patient felt relief in his head. The hearing in this ear was greatly reduced.

In consequence of the retention of secretion in the ear, "an irritative process had been set up in the dura mater, of either a congestive or a reflex nature, manifesting itself in headache and vertigo." The indication was, of course, to open up the canal in order to allow the pus to drain off, and also, if possible, to cure the disease in the middle ear. Therefore the patient was chloroformed, and the external auditory canal disinfected by a 1 : 1000 solution of corrosive sublimate, when a superficial incision was made with a bistoury through the entire length of the tumor in the direction of the axis of the canal. The tumor was then laid bare and gouged off by two or three strokes of the hammer, beginning in front of its base, so that a thin lamella of the posterior bony wall was removed with it. There was a great deal of hæmorrhage, so that a small ridge of bone at the lower portion of the canal was overlooked. This was thrown off as a sequestrum in two weeks. The tumor was 7.5 mm. long and 6 mm. wide, and 5 mm. high, composed of spongy, bony tissue, excepting the external layer, which was compact. The auditory canal was syringed with a four-per-cent. solution of boric acid and well tamponaded with iodoform-gauze. Forty-eight hours afterward a rubber drainage-tube was substituted for the iodoform tampon. During the first week the slightest touch upon the bony wound caused a marked vertigo and almost unconsciousness. In four weeks all symptoms had gone, and the head felt free; as it had not done for five years. The bony wound healed in four weeks. There was finally seen, when the membrana tympani became visible, a large perforation in its lower half, with the handle of the malleus drawn well inward. The hearing for the watch-tick was now 1 cm., and ordinary conversation at three metres. Four months after the operation there was still no return of the otorrhœa.

A Second Case of Injury of the Bulb of the Internal Jugular Vein from Paracentesis of the Membrana Tympani.

Dr. Hildebrandt, the assistant in Professor Trautmann's aural clinic in Berlin, gives an account (*Archiv f. Ohrenheilkunde*, vol. xxx., September, 1890) of the above-named injury, similar to that lately given by Ludewig, as occurring in Schwartze's clinic in Halle. A little girl, four years old, once the subject of otorrhœa, but which had been cured, complained suddenly of earache in the right ear. The membrana tympani had become lustreless, red, and bulging in the lower posterior quadrant. Immediately after an extensive paracentesis, a stream of dark blood gushed from the cut, and flowed from the external meatus in a stream as thick as the little finger. The tampon was applied immediately, the quantity of blood lost being 100 c. c. The hemorrhage stopped at once, and none appeared in the throat through the Eustachian tube. All pain in the ear ceased immediately. In two days the tampon was removed, when the incision was found to be healed. The

malleus was sharply retracted. The membrana was pearl color in its anterior portion, but in the posterior quadrant there was still a bluish-red prominence, the size of a pea. It was subsequently observed that this prominence varied in size at times. The reflection of light in the anterior lower quadrant changed its shape when strong pressure was made on the side of the neck over the internal jugular vein, and then returned to its normal form when the pressure was removed from the side of the neck.

It was concluded by Prof. Trautmann that the prominence visible in the lower posterior portion of the membrana was the bulb of the internal jugular vein protruding through a dehiscence in the floor of the drum-cavity. The patient received no injury from the accident. It was observed in this case that the veins of the right side of the face, especially the external jugular, the anterior and posterior facial veins, were fuller than those of the other side. The patient was rhachitic, and bore the marks of this diathesis in the joints and cranium.

Aural Complications of Grippe.

Dr. Ménière, of Paris, laid his conclusions (*Annales des Maladies de l'Oreille*, September, 1890) on this subject before the French Otological and Laryngological Society, May 10, 1890. He states that aural complications are the result of retro-nasal affections. Of fifty-seven cases, twenty-three lasted four or five weeks. In eleven cases the lesion was unilateral; in seventeen, bilateral. In another series of sixteen cases, nine were unilateral and seven were bilateral, and the duration of the disease was three months. Eight lasted four months, and five were still under treatment by reason of complications—as periostitis and mastoid inflammation. The treatment consisted in warm-water irrigation in the external canal and in the Eustachian tube, paracentesis of the membrana tympani in some cases, and in four instances thermo-cauterization of the mastoid.

Suppuration of the Tympanic Attic and Perforation in Shrapnell's Membrane.

Dr. B. Alexander Randall, of Philadelphia, contributed a very interesting paper on this important subject to a recent number of *The Philadelphia Medical News* (September 27, 1890). "The successful treatment of these cases is, of course, the special end of their study, and the questions of the origin, frequency, and seriousness of the lesions are of fundamental importance." If ear disease is not a large element in the practice of the physician, "it makes up for it by its serious importance." "It is not without cause that suppurations of the ear are bars to life insurance; and more often in these than in any others do we have caries just where the meninges are nearest."

In his investigations, Dr. Randall has included cases of perforation in Shrapnell's membrane, with and without concomitant perforations in the membrana tensa—the portion below the line of the folds of the drum-membrane. As a rule, those without any concomitant perforation in the membrana tensa are (in our experience) the most serious, and are those which demand excision of the membrana tympani and the malleus, as they are

indications of caries in the head of the malleus, and cannot be cured in any other way.

Dr. Randall, however, prefers to rely on other methods, like injections into the attic, as he has not found excision of much value.

The Forms of Neuritis occurring in the Acoustic Nerve as the Result of Meningitis.

Professor Gradenigo, of Turin, has published (*Annales des Maladies de l'Oreille*, September, 1890) the results of further study of this question, in a paper read at the recent Congress at Berlin. He has demonstrated that grave bilateral purulent infiltrations of the acoustic and facial nerves in the internal auditory canal, sufficient to destroy the nervous fasciculi of the cochlear nerve, where these penetrate the tabula cribrosa, are almost constant symptoms of cerebro-spinal meningitis and also of otitic and tuberculous meningitis. Bacteriological examination of microscopic sections revealed in the pus about the seventh and eighth nerves the existence of the same micro-organisms which had provoked the meningitis, viz., the diplo-streptococcus lanceolatus in cerebro-spinal meningitis, and the bacillus of Koch in tuberculous meningitis. Furthermore, Gradenigo detected in the mucous membrane of the vestibular wall of the tympanum these pathogenic organisms in the region of the canal of Fallopius, so that he inclines to the belief that this canal constitutes in cerebro-spinal meningitis the path of transmission of virus from the internal auditory canal to the middle ear. Thus the pathogenesis of purulent otitis media so often following the otitis interna of cerebro-spinal meningitis, can be explained.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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OF PHILADELPHIA.

Gunshot-wound of the Pharynx and Lodgement of the Missile Without any Subjective Symptoms of its Presence.

Dr. Emil Aronson, of Libau, has recorded (*St. Petersb. med. Woch.*, No. 36, Sept. 1890) a unique case of the lodgement in the pharynx of a cylindrical iron projectile weighing nineteen grammes, and four and a half centimetres in length, without producing any subjective symptoms whatever of its presence as a foreign body. A man invented a projectile to be held in the mouth and to be discharged at will by blowing a plunger down upon the fulminating compound. He had not taken the recoiling force of the explosion into consideration, and so the first time he tried his projectile it not

only went off, but the mobile portion, driven backward, broke through his incisor teeth and became firmly imbedded in his pharynx, whence it had to be pried out.

Laryngitis.

A case of subglottic œdema of the larynx, especially in its posterior portion, after the ingestion of two tablespoonfuls of a 2½-per-cent. solution of potassium iodide, one at noon and the other in the evening, has been reported by Dr. Albert Rosenberg, of Berlin (*Deut. med. Woch.*, Sept. 11, 1890). In most cases of œdema of this character the lesion involves the arytenoepiglottic folds, or the epiglottis.

Myxoma of the Epiglottis.

In the *N. Y. Med. Journ.*, Sept. 6, 1890, Dr. S. O. Vanderpoel, of New York, reports a hyaline myxoma of the lingual surface of the epiglottis, in association with pernicious anæmia which terminated fatally. The tumor, the bulk of a horse-chestnut, was removed with the electric incandescent snare, and a slight recurrence took place a few weeks later. Dr. Vanderpoel calls attention to the fact that pernicious anæmia and pseudo-leucocythæmia are frequently accompanied by morbid growths in various portions of the body.

Nasal Hydrorrhœa.

In the *N. Y. Med. Journ.*, Sept. 6, 1890, Dr. T. Melville Hardie, of Chicago, reports two instances of long duration in married German women, forty-three and forty-two years of age respectively; a remarkable coincidence in exemplification of the well-known but little comprehended law of similars. The record is enhanced by an illustrated report by Dr. Casey A. Wood on the eye-symptoms.

Look beyond the Nose.

This is the title of a paper (*N. Y. Med. Journ.*, Sept. 27, 1890) by Dr. Solomon Solis-Cohen, of Philadelphia, in which he deprecates the too frequent attribution of neurotic maladies to abnormal conditions of the interior of the nose. In exemplification he details a case of periodical headaches said to have been of twenty years' duration, treated ineffectively for some two years by various rhino-chirurgical procedures, and substantially relieved, if not cured, by constitutional measures, mainly the administration of quinine hydrobromide.

A second case is reported of excruciating headaches and occasional insomnia for years, variously attributed to uterine, ocular, and nasal maladies, and ineffectually treated on these lines, but succumbing in great measure to constitutional treatment directed to gastro-intestinal irritation and consequent lithæmia. A third case is mentioned in which a patient has had no reflex disorders and does not know what a headache is, despite a deviated and thickened septum in contact with both middle turbinates, a posterior enlargement of one lower turbinate, and engorgement of the erectile tissue upon both sides of the septum posteriorly.

DERMATOLOGY.

UNDER THE CHARGE OF

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Immigrant Dermatoses.

In the *Journal of Cutaneous and Genito-urinary Diseases* for October, 1890, White describes the various dermatoses possessing contagious or inoculable properties which are being gradually introduced into this country through immigrants, especially by the less desirable immigrants. Thus, it is known that the relative frequency of scabies is much greater than formerly; the same may be stated, but to a less degree, of favus. The possibility of an increase in the cases of lupus and also of melanosis lenticularis progressiva (xeroderma pigmentosum) is pointed out; and the discovery of imported cases of leprosy is becoming not at all uncommon. It would seem, moreover, that prurigo is no longer such an extreme rarity here as formerly. The author suggests the following measures for Governmental adoption:

1. To cleanse all immigrants of animal parasites, on landing, by treatment of person and clothing.
2. To retain in quarantine all immigrants with other contagious diseases, including venereal affections, a sufficient time for treatment.
3. To return to their homes all persons affected with such contagious diseases as it is impracticable to treat in such way, as leprosy, tuberculosis, and advanced syphilis.
4. To provide for efficient medical inspection at foreign ports of emigration, with the power of arresting importation of dangerous diseases to this country.

Alopecia Areata following Influenza.

In the *London Lancet* of June 7, 1890, Williamson records a case of alopecia areata following attacks of influenza. The influenza recurred two months after the first attack, at both of which a severe neuralgia of the supra-orbital and occipital nerves was a prominent symptom or complication. The pain was, in a measure, persistent, and later, after several months, was followed by the appearance of bald patches along the course of the affected nerves. The skin of the patches was sensitive and tender to the touch. Recovery gradually took place.

Hereditary Canities.

An interesting example of hereditary canities is reported (*British Medical Journal*, vol. ii. p. 85, 1890) by J. H. Morgan. From the median line of

the scalp toward the forehead a white tuft of hair was present in one or more members of a family for four generations—the maternal grandfather, the mother, the son, and grandchild. In some of the families several exhibited this peculiarity. Another instance, observed by Joynt, is quoted; several brothers, the mother, the maternal uncle and grandfather possessing a somewhat similar white tuft.

The Absorption of Medicaments from Ointments.

With this object in view, Luff has made (*Monatshefte für praktische Dermatologie*, Bd. xi., No. 2) the following preliminary experiments, tending to show that the absorption of different drugs may depend, in a measure, upon the ointment-base employed. The experiments consisted in placing a small quantity of 4 per cent. ointments of iodine, carbolic acid, and resorcin, made up with vaseline, fat, and lanolin, in sheep bladder; these were dipped into beaker glasses containing distilled water, which was slightly warmed (to 98° F.) by being kept in a water-bath. The water was tested at intervals to determine the earliest evidence of the presence of the several drugs. The results were as follows:

Ointment of	vaseline and potassium iodide	. evidence in	1 hour.
"	fat " "	. " in	9 hours.
"	lanolin " "	no evidence in	24 "
"	vaseline and carbolic acid	evidence in	2¾ "
"	fat " "	. " in	7 "
"	lanolin " "	no evidence in	24 "
"	vaseline and resorcin	. evidence in	10 "
"	fat "	. " in	15 "
"	lanolin "	no evidence in	24 "

Luff considers these marked variations due to the physical condition of the ointment-bases employed, and not to any difference in the melting-point, inasmuch as this is about the same—vaseline, 40° C.; fat, 37¾° C., and lanolin, 40° C.

The Influence of Medicaments upon the Culture of the Achorion Schönleinii and Trichophyton.

Elaborate and extensive experiments have been made by Schwengers (*Monatshefte für praktische Dermatologie*, August 15, 1890) bearing upon the question of the parasiticide properties of the various drugs upon the favus and ringworm fungi. The different medicaments were mixed in several proportions with the culture-medium, and the fungus of favus or ringworm introduced. After several weeks, examinations were made and effects noted.

The results obtained by the writer may be given as follows:

Pyrogallic acid both in alcoholic solution (0.1–1 per cent.), and added as a powder (0.1–10 per cent.) prevented development.

Chrysarobin in alcoholic solution (0.1–1 per cent.) and added as powder had practically no influence.

Ichthyol, in aqueous, alcoholic, and ether solutions had a positive effect when strength was above 1 per cent., and 10 per cent. (aqueous solution) prevented all growth.

Resorcin (0.5–5 per cent.) exerted a restraining influence in weakest proportion and absolute in strongest.

Sulphur (0.2–10 per cent.) had no effect whatever.

Cinnabar (1–10 per cent.) had no effect.

Calomel (0.2–10 per cent.) prevented development.

Corrosive sublimate (0.1–1 per cent.) had an absolute influence in hindering growth.

Iodine (0.1 per cent.), no influence; but in proportion of 5 per cent. prevented development.

Tincture of iodine, about the same relatively as iodine.

Iodoform (1–10 per cent.), no effect upon favus fungus, but in strongest proportion had some influence upon the ringworm fungus.

Aristol (0.2–10 per cent.) upon favus fungus negative, and only a limited influence upon the growth of the trichophyton when in the strongest proportion.

Salicylic acid (1 per cent.) was preventive of development.

Salol, in alcoholic solution (0.8–2 per cent.) no influence; but added as a powder (1–10 per cent.) was preventive.

Oil of cade (1–10 per cent.) stopped growth.

Balsam of Peru (20 per cent.) and styrax liquid (20 per cent.) proved destructive.

Alcohol (2 per cent.), no effect; (10 per cent.) slight influence; (20 per cent.) prevented growth.

Aquæ calcis (1–10 per cent.), no influence.

Sapo viridis (50 per cent.) exerted a preventive action.

The following oils and ointment-bases mixed with the culture-medium in 50 per cent. proportion gave the following results: Olive oil and linseed oil, no effect; simple ointment and benzoated lard, a slight preventive influence; yellow vaseline, a slight effect upon the fungus of favus, and absolute influence upon the ringworm fungus; white vaseline, slight preventive influence; anhydrous lanolin hindered development of ringworm fungus, and apparently, although not conclusively, the same effect upon the achorion Schönleinii. [As regards sulphur the writer's results are in opposition to the effect observed in somewhat similar experiments made by Thin a few years ago.—EDS.]

NOTE ON THE DIAGNOSIS, BY MEANS OF THE MICROSCOPE, OF PAGET'S DISEASE OF THE NIPPLE AND BREAST.

MACALLUM has (*The Canadian Practitioner*, October 16, 1890) been able, by examination of sections and crusts from Paget's disease, to confirm the importance of the so-called psorospermiæ to which Darier and Wickham have called attention. Until the nature of these bodies is better known, the writer suggests the name "endocyte." The diagnosis may, therefore, be made in this disease in the earliest stages by the help of the microscope. In the examination of the crust the following method, which gives a permanent preparation, was employed: The crust, or a portion scraped from the nipple, was teased out in a drop of tincture of iodine on the slide, the cover-glass put on, and, after a couple of minutes, a drop of 50 per cent. glycerin run in. The alcohol and the iodine fix the endocytes, and the iodine gives them a brown-yellow tint, which fades slowly in glycerin.

OBSTETRICS.

UNDER THE CHARGE OF

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A Clinical Study of the Urine of the Newborn Child.

Hochsinger (*Wiener medicinische Presse*, No. 41, 1890) concludes an extended study of the presence of indican in the urine of the newborn child as follows: Indican is usually not present during the period of lactation, but a trace of this substance is found in children artificially fed. In breast-fed children indican is entirely absent. Simple dyspepsia and diarrhœa and also habitual constipation in nursing children and young children do not produce this body in the urine. Cholera infantum and chronic diarrhœa result in its formation. When primary intestinal lesions and septic infection are excluded a considerable amount of indican points to the presence of tubercular disease. Children older than nurslings show the same reaction to tests for indican which adults show.

A Study of the Configuration of the Fœtal Head.

Runge (*Zeitschrift für Geburtshülfe*, Band xix. Heft 1) summarizes his study of the configuration of the fœtal head as follows: He considers the existence of a pronounced asymmetry in the skull as caused by labor and occurring in a definite way, as extremely doubtful. The act of labor itself has the greatest part in producing asymmetry of the fœtal skull. The great arching of the anterior parietal bone observed in occipito-posterior positions occurs during the act of labor itself, and disappears so rapidly at the completion of labor that a difference of only about a millimetre can be detected. The arching portions of the frontal bone show no especial difference after labor. The sliding of the bones over each other, and also a protrusion or depression of adjacent bony edges is the result of a distinct motion of rotation.

Ten Cases of Tubal Pregnancy and their Pathology.

Orthmann (*Zeitschrift für Geburtshülfe*, Band xx. Heft 1) has made a careful examination of the specimens in ten cases of tubal pregnancy upon whom he performed laparotomy. These patients ranged in age from twenty-six to forty-four years. The greater number were multiparæ, and, as a rule, more than a year had elapsed since the previous pregnancy. The presence or absence of menstruation differed greatly in the different cases. As a rule, it was absent, but hæmorrhage at the time when menstruation should have occurred was not infrequent. In five of the cases the pregnancy was in the right, and in five in the left tube. The duration of the pregnancy did not

exceed two months. Two of the patients perished, one from hæmorrhage, one from ileus.

Regarding the pathology of the cases, Orthmann feels justified in concluding that a firm organized blood-clot found within a Fallopian tube renders the diagnosis of tubal pregnancy extremely probable. An intra-peritoneal hæmatocele occurring with a tubal pregnancy results either from rupture of the sac of the ovum, or through an abortion of the ovum which had lodged at the abdominal extremity of the tube. The recognition of decidual cells is not a positive proof of a tubal pregnancy. Villi of the chorion can be distinguished in all cases of tubal pregnancy during the early months.

A Remarkable Continuance of Pregnancy in spite of Intra-uterine Manipulation.

Vickery (*Boston Medical and Surgical Journal*, p. 413, 1890) reports the case of a multipara, nursing a child six or eight weeks old, who observed suppression of menstruation. The patient took tansy tea and turpentine without result. An English catheter was then obtained, and daily efforts made for about three weeks to pass it into the womb to interrupt pregnancy. The patient thought that she had succeeded because a constant uterine hæmorrhage resulted. A physician was called, and pregnancy not being suspected, the patient was given ergotin, in all 72 grains, and the vagina was tamponed. As it was supposed that the placenta had been retained from the previous labor, her physician curetted the uterus, and then applied tincture of iodine to the endometrium. Hæmorrhage continuing, a gallon of hot water was injected three times daily for four days. Dr. Vickery, when called in consultation, found the fundus of the uterus near the umbilicus, and pregnancy undoubtedly existing. Labor was then induced, and a five or six months' fœtus was expelled. The woman escaped septic infection or any permanent injury.

The Treatment of Post-partum Hæmorrhage.

In a discussion before the Obstetrical Society of Moscow, Muratow (*St. Petersburger medicinische Wochenschrift*, No. 8, 1890) reported eight cases of post-partum hæmorrhage in which irrigation with a hot solution of creolin failed to check the hæmorrhage. The uterus and vagina were then tamponed with creolin gauze. Pads and a bandage were placed upon the abdomen, by which external compression was made. The tampons and bandages were allowed to remain two days before removal. Good results followed in all cases.

Rostowzew and Alexandrow reported thirteen cases treated by tamponing the uterus. In a part of the cases the result was satisfactory. In others great pain was produced, and the insertion of the hand within the uterus was considered a safer and more efficient expedient.

The Pathogenesis of Eclampsia.

Blanc (*Lyon Médicale*, No. 38, 1890) has studied the blood of an eclamptic patient by making cultures from this blood in sterilized bouillon. After forty-eight hours numerous fine, short bacilli were observed moving rapidly.

Rabits were inoculated with various cultures from this bouillon, and the first two animals inoculated had albuminuria and were severely affected. Anuria was also present, and both rabbits succumbed after the inoculation. A third rabbit was given an intravenous inoculation of the bouillon, which was not followed by anuria. Two days afterward a second injection of double the quantity of the same material was given. Seven or eight hours afterward the rabbit died in convulsions, having voided a very small quantity of urine which contained much albumin. The kidneys were found intensely congested. The same culture-fluid was then treated with hydrate of chloral, 2 to 1000, and proved harmless when injected. The culture liquids, when set aside and mixed with chloral in various proportions, remained sterile. It was found that 30 to 45 grains of chloral to the quart constituted an excellent antiseptic for the microöganisms inoculated in the blood in eclampsia. The proportion of chloral is 4 to 1000, to destroy effectually these germs.

The Relation between the Diameters of the Child's Head and those of the Mother.

Skalkowski (*Archiv für Gynäkologie*, Band xxxviii. Heft 3) finds that the cranium of the child born at term shows a remarkable resemblance to that of the mother, especially as regards the degree of projection of the parietal eminences. The bi-temporal diameter is less proportionately than the corresponding diameter of the mother's head in primiparæ by an inch and three-fourths, the bi-parietal two inches, and the sub-occipito-bregmatic two and a half inches.

Obstructed Labor from Anteflexion of the Uterus.

Morgan (*Occidental Medical Times*, p. 571, 1890) reports a case of prolonged labor in which descent of the head failed, apparently by reason of some obstruction. The pelvis was normal. Efforts at delivery by the forceps and by version failed. After labor had persisted until the child was dead, a second attempt at version disclosed excessive anteflexion of the pregnant uterus. The fundus seemed to form a pocket anterior to the patient's abdomen. Descent of the uterus had not taken place, the womb being imbedded or surrounded by fatty tissue and old adhesions. Efforts at delivery increased the flexion, and constricted the fœtus to a greater degree.

A Hitherto Unrecognized Cause for Amniotic Bands and Adhesions causing Amputation of the Fœtal Limbs.

Küstner (*Zeitschrift für Geburtshülfe*, Band xx. Heft 2, 1890) reports the interesting case of a multipara who suffered from hæmorrhage continuing for two days, occasioned by lifting a heavy weight at the end of the second month of her pregnancy. She went on to term, however, and was delivered of a living child. On examination, although symptoms of asphyxia were lacking, the child was cyanotic and the eyelids slightly œdematous. This condition disappeared in two days after birth. The hands and feet of the child showed multiple amputations of phalanges. The placenta was of moderate size, and the membranes were extensively torn, but seemed to be com-

plete. The decidual layer on the upper surface of the chorion was very thin, and a dark-colored blood-clot was found near the edge of the placenta. An examination of the fœtal surface of the placenta showed a lack in its usual amniotic covering. When an effort was made to separate the amnion from the chorion it was found that the amnion was absent, the membranes consisting of the chorion and a thin layer of decidual cells. The placental insertion of the cord was peculiar, because of the presence of a sheath of tissue extending three-fourths of an inch upon the cord. A microscopic examination of the membranes showed a layer of large ovoid decidual cells; next to these a layer of small round cells, and next, connective tissue. Küstner's explanation of the case is that the amnion and chorion became separated at the time when the lifting of the heavy weight occurred, followed by the hæmorrhage during pregnancy. Where amniotic bands adhered to the fœtus amputation followed. Compression of the umbilical cord caused the cyanosis observed at birth. Two similar cases have been reported by Gustave Braun, although the pathology of the cases was not recognized.

Amniotic Bands and Congenital Amputations.

An interesting study of a case of this sort is reported by Therese and Broca (*Bullétins de la Société Anatomique de Paris*, November, 1890, p. 473). Complete amputation at the upper third of the left leg had taken place, the stump not having fully healed. The left hand showed webbed fingers, and to these fingers a long fibrous band was attached. A careful dissection by Broca revealed the skeleton profoundly modified by the amniotic bands which could be in some places detected. The question is raised as to whether these amputations could be instances of ainhum, but there can be no doubt that adherence of the amnion to the fœtus produces these amputations.

Nephritis and Abortion.

A case illustrating the pathology of nephritis during pregnancy is reported by Gautier (*Revue Médicale de la Suisse Romande*, No. 11, 1890). The case was a multipara aged twenty-seven years, with previous excellent health. Obstinate vomiting occurred early in pregnancy, followed by prostration and dyspnœa with œdema. Albumin was very abundant in the urine. It became necessary to produce abortion, although the secretion of urine was abundant in amount. Granular casts were also present. The induction of abortion was accomplished by introducing tampons within the cervix. Abortion was followed by the extraction of the placenta and the subsidence of all the symptoms. Upon examination the placenta was found cystic, and with sufficient extent of its surface occluded by white infarcts to account for the death of the fœtus before its expulsion. The early appearance of the albuminuria was also a point of interest.

A Case of Intra-uterine Infection with Typhoid in a Viable Child.

Ernst reports (*Ziegler's Beiträge*, Band viii. Heft 1) the case of a viable child born of a mother ill with typhoid, but never nursed by her. On the

fourth day after birth it became suddenly stupid, was marked with jaundice, and showed a fine exanthem upon the legs and lower part of the body. Death ensued. Upon post-mortem examination, icterus, deep injection of the mucous membrane of the stomach, with excessive enlargement of the spleen, were present. Cultures made from the blood of the heart and spleen in the arteries and Malpighian bodies developed typhoid bacilli. It is probable that a large number of bacilli entered the child's circulation suddenly, and increased in number rapidly.

Post-partum Eclampsia and Eclampsia Caused by Fæcal Intoxication.

Flesch (*Münchener medicinische Wochenschrift*, No. 42, 1890) reports a case of a patient delivered, after a tedious labor, by forceps, the bladder being apparently empty before delivery. After delivery a tumor was felt in the left lumbar region which disappeared after friction had been made upon the relaxed uterus. The bladder was then discovered to have filled, and a large amount of urine was withdrawn. Flesch diagnosticated hydronephrosis from compression of the ureter. When the uterus contracted and the pressure was removed the urine suddenly entered the bladder. The eclamptic convulsions which occurred after delivery were caused by the absorption of toxic material from the urine retained in the pelvis of the kidney.

A second case of eclampsia was closely related in etiology, albumin increasing as constipation persisted. Flesch remarks that in scarlet fever the albuminuria increases during constipation, and diminishes when this cause is not present. He treats his cases in accordance with this observation.

Laceration of the Perineum and Vaginal Outlet; Repair of the Recent Tear.

Robb (*Johns Hopkins Hospital Bulletin*, December, 1890) states in regard to the repair of such a laceration, that for the immediate operation, the operator must have plenty of hot water at hand, and an ounce of a ten-per-cent. solution of cocaine, if several days have elapsed; in the latter case, while preparing for the operation, the surgeon should place a pledget of cotton, saturated with the solution, within the vagina, and allow ten minutes to elapse to secure its local anæsthetic action.

The only instruments necessary are a needle-holder, a pair of scissors, and a needle threaded with a loop to carry sutures, and perhaps a spoon to hold up the anterior vaginal wall.

The patient should be brought to the edge of the bed in front of a good light, with her buttocks resting on a perineal pad, which will conduct the water used in cleansing and irrigating the parts, by means of the apron, into a bucket beneath. Upon flexing the knees on the abdomen and separating the labia, a deep ragged rent will appear in the posterior vaginal wall, beginning at the fourchette as an apex and extending up to the columna posterior within, and on the perineal surface down toward the sphincter ani. This is the deepest form of superficial tear, involving neither vaginal sulci nor the sphincter ani without.

To proceed with the operation, the labia should be separated by the two

fingers introduced within the vagina, and the whole wounded surface thus exposed. The sutures, of silk or silkworm-gut, should be passed a quarter of an inch apart, beginning at the upper angle of the wound and introducing the needle an eighth of an inch from the margin of the tear on the vaginal mucous membrane and bringing it out at the bottom of the rent, at a point much nearer to the operator than the point of entrance, and re-introducing it at the bottom of the tear, and bringing it out on the opposite side at a point corresponding to the original point of entrance. The object of passing the sutures thus is to pull up the floor of the rent as high as possible, for, by the labor, the whole pelvic floor is depressed, and those parts lying in the middle, more so than those at the sides. By means of the sutures thus introduced the tissues at the sides less movable than those in the centre, because of their close attachment to the pubic rami, become the points toward which the depressed centre is raised.

These sutures can be tied at once from above downward, and by this simple arrangement almost the whole wounded area can often be disposed of by as few as three sutures.

Two or three superficial perineal sutures on the outside will finally give a perfect closure, thus restoring the perineum and vaginal outlet to their original integrity.

The after-treatment is of great importance, as there is danger of doing both too little and too much. The general injunction that the patient must lie motionless in the recumbent position, is not necessary. She should be allowed to move very gently from side to side, preventing the knees from separating widely. Another important detail of the after-treatment is the regulation of the bladder. She should be allowed to pass her water if she can, and if this is impossible, a clean glass catheter should be used every six or eight hours. Before catheterization, the parts should be cleansed, particularly around the urethral orifice, with a piece of absorbent cotton. After the urine has been passed, the labia minora should be gently separated, and any fluid around the orifice of the vagina gently taken up on a piece of absorbent cotton, and some antiseptic powder sprinkled within the vulvar orifice by means of a camel's-hair brush or a pledget of cotton held by a pair of dressing-forceps.

GYNECOLOGY.

UNDER THE CHARGE OF

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The Treatment of Retroflexion by Pelvic Massage.

Döderlein (*Med. Anzeiger*, August, 1890) has simplified Brandt's method of treating posterior displacement. Having restored the tone of the relaxed uterus in a few *séances*, by stroking the organ in a direction from the fundus

toward the cervix, he seeks to bring it to its normal position of anteflexion by forcing the cervix forward and upward with the finger within the vagina, while the hand upon the abdomen crowds the body of the uterus downward and backward upon the cervix. This forced compression causes an elongation of the shortened posterior wall of the organ. If there is no peri-uterine inflammation considerable force may be employed without giving pain. This method is particularly applicable to cases of retroflexion occurring during the puerperium. The writer reports six cases, in four of which, by daily *séances* of five minutes' duration, he succeeded in restoring the uterus to a position of permanent anteflexion within from two to four weeks.

Sarcoma of the Uterus.

Kaltenbach (*Ibid.*) reported seven cases of this affection, the disease being confined to the corpus uteri in two, to the cervix in three, and involving both cervix and body in two. Between diffuse round-celled sarcoma of the endometrium and fibro-sarcoma, he stated there were many transitional forms. The uterus was extirpated per vaginam in every instance but one, when the organ was so large that it was necessary to adopt the combined method. All the patients made a good recovery, but two had a recurrence within eight months, and in the case of four others a year had not yet elapsed since the operation; one patient was in robust health at the end of two years and a half. Their ages varied from twenty-five to forty-seven. Recurrence took place in the form of metastatic nodules within the abdomen. In an eighth case (that of a girl, æt. fifteen), in which supra-vaginal amputation was performed there was metastasis in the retro-peritoneal glands. In a ninth inoperable case the patient had formerly had a placental mole removed, which seemed to confirm Leopold's observation that sarcoma of the corpus uteri might originate from adherent portions of myxoma chorii, which latter Virchow regards as a true neoplasm.

Reduction of Chronic Inversion of the Uterus by Hydrostatic Pressure.

Neugebauer, Sen., (*Ibid.*) contends that this is the ideal way of reducing chronic inversion, supporting his opinion by a case of two years' standing, in which reduction was effected in nineteen days by means of a rubber bag which was gradually distended with water. The patient suffered no pain, and learned to fill and empty the bag herself when it was necessary to relieve the pressure upon the urethra. The writer considers this as the safest and least painful, although it may be the slowest, method of reduction.

Pseudomucin in Ovarian Cysts.

In an elaborate paper with this title Pfaunenstiel (*Archiv für Gynäkologie*, Band xxxviii. Heft 3) makes a contribution to the study of the chemistry of cyst-contents. He concludes that there are several varieties of pseudomucin, which resemble mucin in setting free sugar when treated with acids, but differ from it in their behavior with acetic acid. The most common variety is the tenacious pseudomucin found in proliferous adeno-cystomata.

A second variety forms a firm colloid mass closely related to colloid cancer; a third appears as a watery fluid easily soluble, and found in only a few ovarian cysts. The first variety is a true cell-secretion; the origin of the other two is unknown, though the third may be a product of cell-disintegration. It is evident that, practically, the presence of pseudomucin in fluid withdrawn for diagnostic purposes from an abdominal tumor does not prove that it came from an ovarian cyst, as it has been found in cancerous ascitic fluid.

The Treatment of Abscess of the Tube and Ovary by Vaginal Incision.

In a recent discussion at the Société de Chirurgie, Terrillon stated (*Le Semaine Médicale*, No. 28, 1890) that up to 1888 he had treated this condition by vaginal incision and drainage with indifferent success, since which time he had invariably employed abdominal section and extirpation of the diseased adnexa. Terrier said that he had never been able to see any advantage in vaginal drainage, since, aside from the immediate dangers, a permanent fistula usually resulted, so that the patient was not cured. He recommended laparotomy in every case of peri-uterine suppuration. No matter of whatever origin, elevation of temperature in connection with disease of the adnexa was a sufficient indication for abdominal section. Deprès insisted that a distinction should be made between pelvic abscesses proper and those which had their seat in the ovaries or tubes. He had repeatedly cured pyosalpinx by puncture *per vaginam;* vaginal incision and drainage were, of course, to be recommended only when the abscess clearly pointed in the posterior fornix.

The More Remote Results of Removing the Ovaries and Tubes.

Kelly (*Johns Hopkins Hospital Bulletin*, 1890) summarizes from his experience in ninety-six cases of salpingo-oöphorectomy as follows: A small percentage of the patients were restored to perfect health within a few weeks after operation, a larger number were eventually restored to comparative health, and a few were no better subjectively after the operation. He adds the following suggestions for avoiding some of the ultimate bad results of laparotomy: 1, as the ligature often remains as a septic focus, it should not be passed through the pedicle of a pyosalpinx as long as there is pus in or about the stump; 2, a large-sized drainage-tube should be used, and should be dispensed with as early as possible; 3, the operator should work deliberately and carefully, handling the intestines as little as possible; 4, the specimen should be carefully inspected before the abdomen is closed, with the purpose of determining if any portion of the ovary or tube has been left behind; 5, the patient ought to remain longer in the hospital, and should be kept under observation for months after the operation.

Endothelioma of the Ovary.

Pomorski and von Velits (*Zeitschrift für Geburtshülfe und Gynäkologie*, Bd. xviii. Heft 1) each report a case of this rare affection, which is to be

regarded histologically as angeio-sarcoma, developing from the walls of the capillaries. Eight cases in all have been reported by German authors, the first by Leopold.

Case I.—The patient, who was forty-nine years of age and had reached the menopause sixteen months before, applied at Martin's clinic complaining of severe pain in the right iliac region. She was found to have an ovarian tumor which was removed with considerable difficulty, the patient succumbing on the third day. The growth was at first regarded as carcinomatous, but on careful microscopical examination it was pronounced to be an "endothelioma lymphaticum."

Case II.—Professor Tauffer, of Buda-Pesth, operated upon a virgin, æt. twenty-four, who had had a tumor nine years, the size of a man's head. It sprang from the left ovary and was so firmly adherent that the patient did not survive the shock of its removal. Microscopically it proved to be an "endothelioma cysticum myxomatodes."

The Condition of the Endometrium in Cancer of the Cervix.

Saurenhaus (*Zeitschrift für Geburtshülfe und Gynäkologie*, Bd. xviii. Heft 1) has made careful microscopical studies of cancerous uteri with the view of verifying Abel's statement that the corporeal endometrium in cases of cancer of the cervix undergoes sarcomatous degeneration. He examined fifty uteri which had been removed *per vaginam* from the living subject, the disease being confined to the portio-vaginalis in twenty-two, and the cervix being involved in twenty-eight. He was unable to find any evidence of sarcomatous degeneration of the corporeal endometrium, or, in fact, any evidence of malignant changes. The microscopical appearances were those seen in ordinary hyperplastic endometritis. Spindle-cells were uniformly present, but always in the vicinity of the hypertrophied glands. [As the writer aptly concludes, these careful and exhaustive observations destroy an argument in favor of total extirpation of the uterus for cancer of the cervix, as opposed to high amputation, upon which considerable stress has been laid, viz., that even when the disease is limited to the portio-vaginalis, the corporeal endometrium may have already undergone malignant degeneration. We have been able to demonstrate to our own satisfaction, from an examination of twenty cancerous uteri, that there is nearly always present a marked degree of hypertrophy of the corporeal mucosa which might readily be mistaken for a malignant growth. Since the uterus is uniformly enlarged and congested in connection with carcinoma of the cervix, hyperplastic endometritis would naturally be present, as in cases of subinvolution and myofibroma. Pathological observations, in order to be of practical value, must be absolutely unbiassed. It is fatal to the worker in the laboratory to be too strongly tinged with surgical enthusiasm.—Ed.]

The Origin of Epithelial Growths of the Ovary.

Steffeck (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xix. Heft 2) concludes an elaborate article on this subject with the following deductions: 1. Ingrowths of the germ-epithelium are observed only in tumors, never in

normal ovaries. 2. The germ-epithelium retains its normal appearance longest in cysts that are undergoing cancerous degeneration. 3. Ingrowths of germ-epithelium do not arise by active proliferation of the epithelium. 4. The follicles may form irregular spaces lined with a single layer of cells. 5. The epithelium lining the primary and ripe follicles may form epithelial pouches which subsequently become shut off and form new cysts. 6. During the early stages of degeneration of the follicles the ovum is still visible. In short, epithelial growths of the ovary may originate from follicular epithelium, as well as from ingrowths of germ-epithelium.

The Anatomy of the Normal Endometrium.

Boldt read (*Med. Anzeiger zum Centralblatt für die Ges. Med.*, August 30, 1890) a paper on this subject at the recent International Medical Congress in which he sought to prove that the utricular glands, both in the cervix and in the body, are surrounded by interlacing muscle-fibres, which are continuous with both the muscle-bundles of the uterine wall and with those traversing the lymphoid tissue of the mucous membrane. This periglandular muscular layer is developed most richly at the junction of the mucosa and muscularis mucosæ, and extends along the glands up to their mouths. The natural inference is that by their contraction the fibres assist in discharging the natural secretion of the gland.

The Bacteriological Examination of Pelvic, Tubal, and Ovarian Abscesses.

Boisleux (*Ibid.*) from a careful study of forty-two cases arrives at the following practical conclusions:

1. The escape into the peritoneal cavity of pus from diseased tubes, or abscesses, should always be carefully guarded against.

2. The amount of such virulent pus which escapes is of no importance, since a small quantity is as dangerous to the patient as a large quantity.

3. If this accident occurs the operator should not be satisfied with irrigating the cavity with sterilized water, but should use some weak antiseptic, such as would cause the least possible irritation of the peritoneum. Cauterization of the pedicle after removal of a pus-tube, and packing pelvic abscesses with iodoform-gauze are efficient means for preventing infection.

Intra-uterine Galvanization a Scientific Error.

In a paper with this title (*Ibid.*) Daniou attacks Apostoli, affirming that the constant current does not have a general caustic action, since the electrode comes in direct contact with only a few points on the mucosa. He cites in support of this a fatal case of Apostoli's in which a current of over 100 milliampères had been used several times, and yet at the autopsy no evidence of any caustic action was found within the uterus, except at the os internum. With regard to galvano-puncture, it was urged that the finer the needle employed the more marked was the result obtained, which in itself appeared to be a contradiction. The writer's own method of applying electricity was by means of a tampon of sponge (*tampon électrique*) which was almost entirely

covered by rubber. This he saturated with salt water, applied to the portio vaginalis, and passed through it a current varying from 70 to 150 milliampères for not longer than six minutes, when the current was reversed, and this was repeated two or three times. The advantages claimed for this method of application over the intra-uterine were absence of pain, rapid diminution in the size of the growth, checking of hæmorrhage (without recurrence, as was noted after intra-uterine galvanization), relief of pain, and, above all, absolute safety. He had practised his method 2000 times without a bad result, whereas, in Paris, the average mortality with intra-uterine galvanization was at least 5 or 6 per cent. [This attack upon Apostoli seems to us to be at once unjust and uncalled-for. The writer appears to be influenced by some personal animosity which prevents him from viewing the subject in a broad and scientific spirit. The work of Apostoli is too well established to be shaken by such attacks, and his statistics alone are a sufficient reply to his detractors.—ED.]

PÆDIATRICS.

UNDER THE CHARGE OF

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PNEUMONIC FORM OF TUBERCULOSIS IN CHILDREN.

According to HUTINEL (*Rev. Mens. des Mal. de l'Enf.*, June, 1890), in the acute form of tuberculosis in children the apices of the lungs are frequently uninvolved, tubercles being generally disseminated throughout the remainder of the organs. A very interesting form of tuberculosis is that which presents the appearance of pneumonia. In a case of this character there was malaise for fifteen days with slight elevation of temperature. Eight days later there were loss of appetite, vomiting, and cough. Physical examination showed dulness in the supra-spinous fossa, murmur, and bronchophony—in a word, there were signs of pneumonia in the superior lobe of the lung. Defervescence followed, but the tongue remained dry, the general condition was bad, and the temperature rose. Tuberculous pneumonia was diagnosed, and in a few days the child died with phenomena of meningitis. The autopsy showed extensive caseous pneumonia. In children, a pneumonia which has not resolved by the eighth day is almost always tubercular in character.

In a second child, who had been sick only three days, there were signs of pneumonia at the apex, but there were also cavernous râles at the apex, rough breathing, and fever to an unusual degree. Tuberculous pneumonia was diagnosed, and this diagnosis was subsequently found to be correct.

Such possibilities must be remembered in treating pneumonia, thus allow-

ing a certain reserve as to prognosis. The prognosis of ordinary pneumonia in children is always favorable, while that of tuberculous pneumonia is uniformly bad.

Salol in the Gastro-intestinal Diseases of Children.

In the treatment of these disorders, Droixhe found (*Journ. d'Accouchements*, February 28, 1890) that salol administered by the mouth is unchanged until it reaches the intestine and is acted upon by the pancreatic secretion. It is then decomposed into carbolic and salicylic acids. Barr reports thirty-five cases of gastro-intestinal inflammation which were treated with this agent. In cases in which there was acute gastro-enteritis with vomiting and copious offensive stools salol was efficacious. If the stools were lumpy and the vomit mixed with bile calomel gave better results than salol. With the serous stools of dysentery and colic, opium should be combined with salol to allay the tenesmus. Salol was found efficient in the first period of acute gastro-enteritis and the chronic forms of entero-colitis. The dosage was three centigrammes for children under six months of age, three to nine centigrammes for those of sixteen to eighteen months, and twelve centigrammes for those who had passed the second year. The drug is easily given, and is without toxic action. It is an approved intestinal antiseptic, ranking with naphthol, naphthalin, bisulphide of carbon, and Belloc's charcoal. It may be combined with saccharate of cannella in the treatment of cholera infantum. Loewenthal used it to prevent the proliferation of the bacillus of cholera and the formation of toxine, which is produced by contact of the bacillus with the pancreatic secretion, in the presence of peptonized albuminoids. Experiments were made by this author upon mice, infected material being injected into some of them without salol, and into others with salol. The former became very sick or died, while the latter were unaffected.

Icterus Neonatorum.

Neumann (*Virchow's Arch.*, cxiv. 3), in earlier publications, has shown that in icterus neonatorum the biliary coloring-matter distributed through the blood, the transudations, and the tissues, has a tendency—post-mortem—to take a granular and crystalline form. For the investigation of this subject, one may take a small piece from the great omentum and spread it out under the microscope. A little dilute acetic acid being added to break up the red corpuscles, one may see the fat cells crammed with bilirubin granules, pigment-needles being absent. In fœtuses which die during or immediately after birth, traces of bilirubin may usually be found. In eight cases the pigment-formation was limited to the fatty tissue, including the greater omentum, the subserous tissue of the parietal peritoneum, the capsule of the kidneys, the pericardium, and the mediastinum. In these cases there was no question about the conversion of the blood coloring-matter into biliary coloring-matter, as is the rule in fœtuses which have died *in utero*. In cases in which biliary coloring-matter is present, and in which the imbibition of bile from the surrounding tissues can be excluded, there is often sufficient biliary coloring-matter in the blood to give the skin an icteric color, though the children might have been normal at birth in other respects. If it were

only possible to demonstrate in the blood of the umbilical cord, in children born alive, the presence of biliary coloring-matter, we should have a clue to the proof that icterus neonatorum is a consequence of certain misdirected physiological processes of fœtal life; but as yet no one has been able to do this.

Nephrotomy for Tumors in Children.

Fischer performed (*Jahrb. f. K.*, xxxi. 1 and 2), between 1873 and 1883, ten operations upon children for the removal of renal tumors. The operation was fatal in eight of the cases, and the disease recurred in one of the remaining ones in nine months, and the other in a year and a half. Six nephrotomies were performed between 1883 and 1889 upon children, one dying from the operation and five from recurrence of the tumor. From 1873 to 1888 thirty-one nephrotomies were performed on children, four being incomplete on account of serious complications. The tumors in two cases were non-malignant, one patient dying, the other recovering. Of twenty-five operations in which there was malignant disease, death occurred in one case from hæmorrhage, and in nine from shock, vomiting, carbolic-acid poisoning, or intestinal paralysis; in seven others death was occasioned by recurrence of the tumor. There were nineteen cases of sarcoma, one of encephaloid cancer, one of adeno-sarcoma, one of myxo-sarcoma, one of carcinoma, two of spindle-celled sarcoma, one of alveolar sarcoma, one of myo-sarcoma, three of round-celled sarcoma, and two of spindle- and round-celled sarcoma. The right kidney was diseased in eight cases, and the left in five. The ages of the children varied from eleven months to eleven years. All operations upon children under two years of age were fatal. Of the intra-peritoneal operations, 52 per cent. were fatal; of the extra-peritoneal, only 10 per cent. Contra-indications to the operation are great weakness, absence of one kidney, disease of both kidneys, very large tumors, and metastatic deposits. Life may be prolonged by the operation, which will be of value according as it is done early in the history of the disease.

The Functions of the Normal and the Diseased Stomach and the Therapeutic Results of Irrigation of the Stomach during Infancy.

Leo experimented (*Jahrb. f. K.*, xxxi. 1 and 2) with thirty infants ranging in age from two hours to twelve months. An hour to an hour and a half elapsed before the removal of the contents of the stomach in breast-fed children in the first few months of life; with older children fed with cow's milk the time was two hours. The food contents of the stomach being removed, there still remained a small quantity of yellowish fluid which showed all the characters of the secretion of the stomach. It was regarded as the residuum from the digestive process. Fifteen minutes after milk was taken there was found a weakly acid reaction to the withdrawn fluid. Within an hour free hydrochloric and lactic acids were discovered. The hydrochloric acid is at first taken up by the milk as soon as it is secreted, part of it being neutralized, and part entering into acid combinations. Albumin-digesting ferment and lab-ferment were always demonstrable in the full or the fasting

stomach, even in the newly-born. The contents of the stomach being removed at varying periods after eating, it was found that actual peptonization of the albumin took place, though only to a very slight degree. Notwithstanding the want of free acid in the stomach, very many of the germs taken with the food are destroyed in the process of digestion. The pathological questions pertaining to this subject were studied in the examination of one hundred and four infants who suffered from acute dyspepsia, cholera infantum, or chronic gastro-enteric disease. In all cases it was found that the milk remained in the stomach an abnormally long time, owing to deficient motor function in the muscular structure of the organ. Marked acidity was present in many cases, as the result of the formation of abnormal organic acids or the excessive secretion of hydrochloric acid in consequence of the irritated condition of the stomach. Pepsin and lab-ferment were found in all cases. It was considered a fair conclusion that by removing the decomposing matter from the stomach, preferably by irrigation, a cure would result in many cases of acute and chronic disease. Very good results were obtained by the author in cases of acute dyspepsia with constant vomiting, also in simple or severe diarrhœa. In cholera infantum the results were less satisfactory.

Corrigendum.—On page 57 of the January number of the JOURNAL, on 16th line from the bottom, for Dr. Hahn *Dr. Kahn* should be substituted; on third line from bottom, for salt bags, read *ice bags*.

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